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BITS & BYTES

December/January 1986/87 $2.50 (Inc. GST)

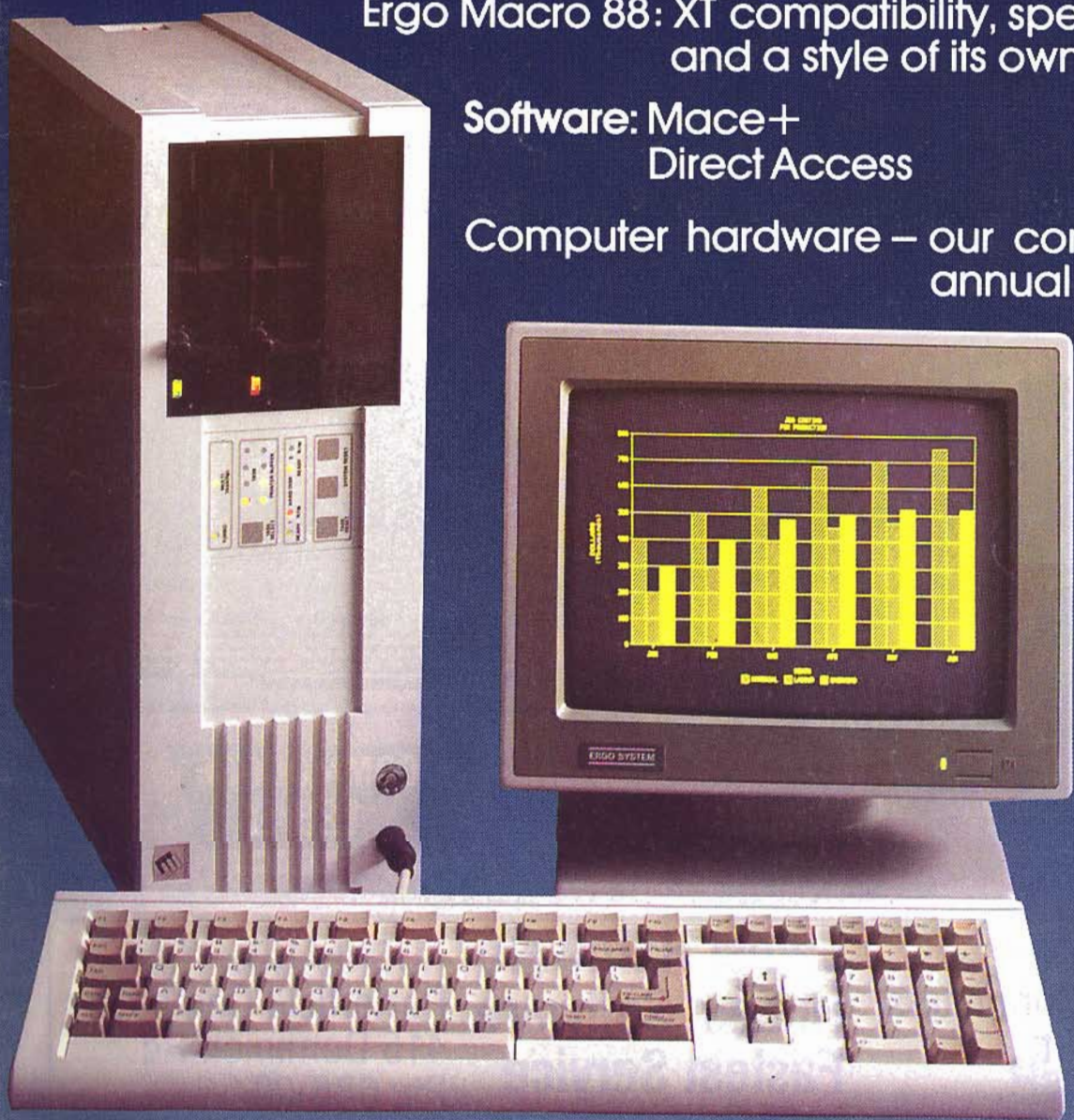
Hardware: Amstrad's PC 1512 Into the 16-bit league

Star: updated, versatile

Ergo Macro 88: XT compatibility, speed and a style of its own

Software: Mace+
Direct Access

Computer hardware – our comprehensive annual roundup



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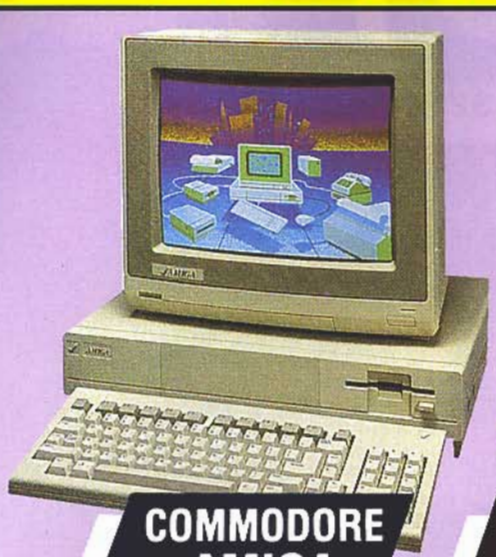

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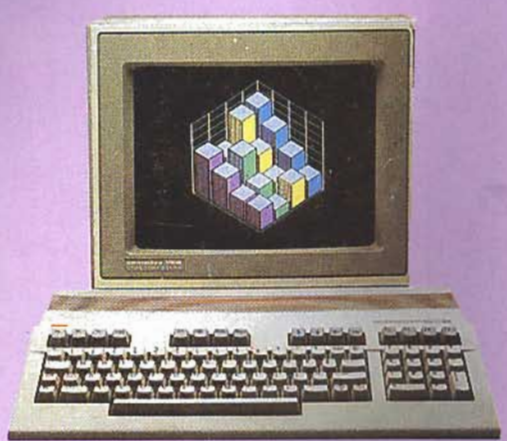

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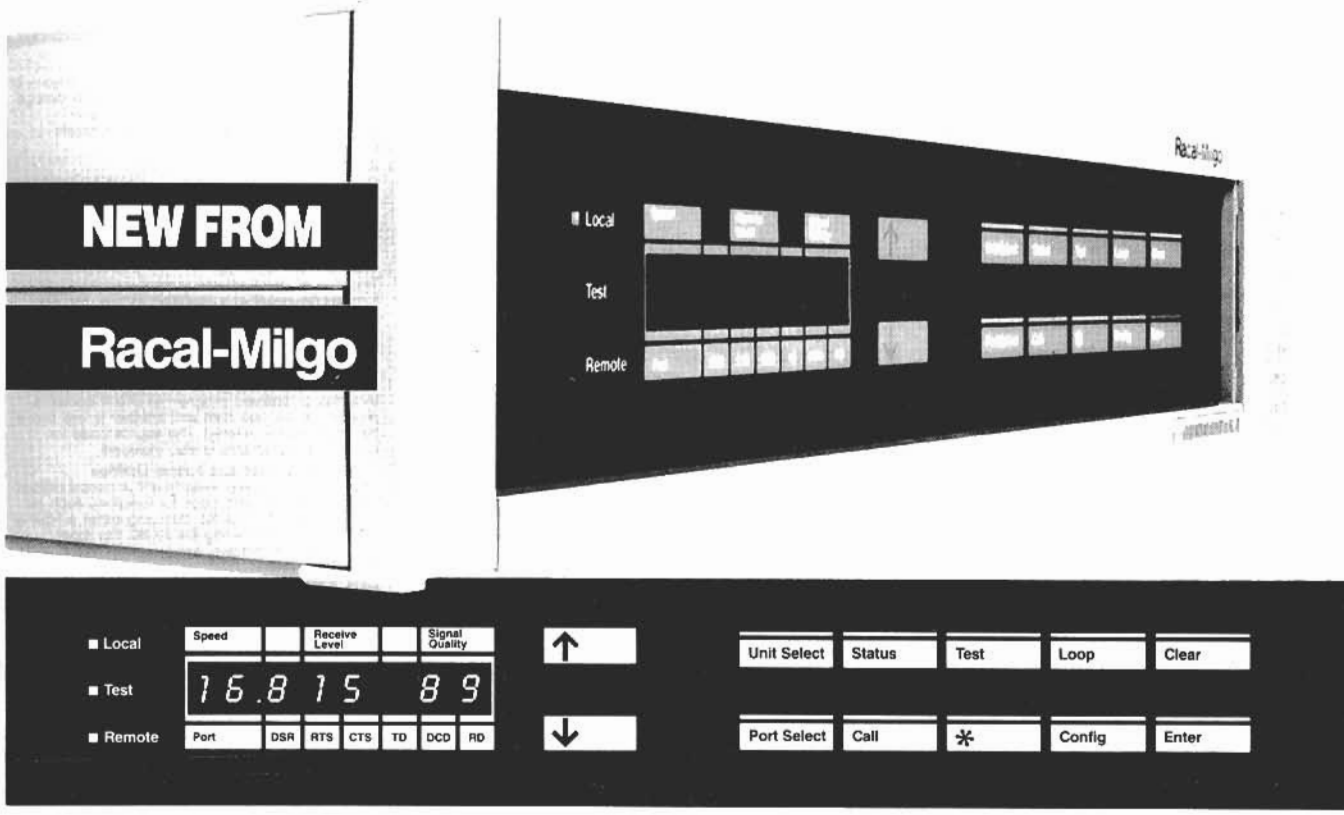

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New Apple to byte

"Apple II is forever," said CED's general manager Mal Thompson last month when releasing the new Apple IIGS (graphics and sound). "We held it back on purpose until we knew what to do with it, but the Macintosh is the serious business product – this addresses the rest."

With its 16-bit 65C816 processor and standard 512Kb RAM, the IIGS is said to offer 90 per cent compatibility with existing II series software while having Macintosh-like mouse, icons, windows and pull-down menus. At the same time, an existing IIe can be turned into a GS with a new motherboard and base pan, a modification expected to be available from March next year for around $1600.

Supplies of the IIGS itself will initially be limited, but should be ready for Christmas at a cost of about $4,600 for the colour version, including a 3.5-inch external disk drive. The monochrome model when available should be about $500 cheaper.

Line-of-sight

Fibre optics technology offers a new twist on the old WYSIWYG (what you see is what you get) saying, and a range of short-haul fibre optics now available in New Zealand is one means of improving the integrity of sensitive electronic data transmitted by cable.

Both security (eavesdropping) and electronic "noise" interference (often caused by proximity to heavy current-carrying cables) are problems with conventional data cables, which also have limited length. Cory-Wright and Salmon Electronics, distributors of systems made by Belling Lee, says that short-haul fibre optics can run up to 3 km while carrying 16 channels per line with full data integrity.

Merger

Taking effect from the beginning of the new year is a merger between KMG Kendons and Coopers and Lybrand. The MicroLab arm of the business will not move, although Grant Furley, the KMG partner responsible, is leaving chartered accountancy for a marketing role in the commercial world.

Communicating computer

Apricot is working with British Telecom to develop a new computer with telecommunications capabilities. The PC manufacturer said recently that the project was begun a year ago, with research expected to continue for at least another year.

British Telecom has declined to confirm the project, saying only that it is "continually evaluating new products and partners", and that it isn't "company policy to comment on speculative reports".

New Manager

Chevron, the Tauranga software house, has appointed David Anstice as its new national marketing manager, to be based in its Auckland office. A qualified ACA with previous consultancy experience in contract accounting, he has worked with Paxus for more than three years on the Paxus Charter commercial systems and IAL.

New dogs, old tricks

Users upgrading from 8-bit to 16-bit machines will be able to run their old CP/M programs, with a bit of help from FBN Software of Australia. PC-Eighty uses the new V-20 chip from NEC which can execute both 8080 (8-bit) and 8088 (16-bit) code, and while total software and hardware compatibility is maintained, the 16-bit performance is said to improve slightly.

Local assembly contemplated

Warburton Franki, NZ distributor for the Zenith range of PCs, is hoping for some spin-off from the parent Zenith $US242 million contract for some 90,000 Z-200 PC compatibles to the US military. Local assembly of Zeniths is possible, "once New Zealand sales reach a viable level", according to Warburton Franki, adding that local assembly would provide "a buffer against fluctuations and a lead-in to increasing local content".

Power and speed

Compaq, the Houston-based manufacturer, has announced its IBM compatible powered by the Intel 80386 chip. The Deskpro 386 is designed for business users wanting speed, particularly in large databases and spreadsheets, as well as technical and CAD applications.

With its 32-bit architecture, the Compaq 386 runs at up to 16MHz and offers standard 1Mb memory, expandable to 2Mb on the motherboard or 10Mb on the 32-bit bus. Two versions are offered: the Model 40 with 1.2Mb floppy drive and half-height 40Mb fixed disk; and the Model 130 with floppy and full-height 130Mb hard drives.

Hire service

Racal Milgo has entered the arena of equipment rentals, offering a scheme for hiring modems and multiplexers for periods ranging from one to 35 months. "With digital data on its way, a number of companies are unsure of which way they should be heading," says general manager Kevin Towns. "First-time users are unsure of the speed they need, and this way they can test for the optimum."

Modems in the range of 2400-14400 Baud, and multiplexers from 4-port to 32-port are offered, at monthly rates based on 1/36th the retail price of new equipment.

New modems

Recently announced by Compuspec are two modems, one a low-end model intended for all PC users and the other a full duplex said to offer high reliability with high throughput. The M50 is a V21, V23 (300/300, 1200/75) modem incorporating a microprocessor, while the V22 (1200/1200) has a number of features to provide reliable data transfers over long distances on public telephone networks.

Not just a clone

by Mark James

What – another clone? Another IBM-PC/X7 knockoff with a dual-speed 8088 processor, 360Kb floppy and 20Mb hard disk? Haven't we had enough of those?

When a new IBM PC-compatible computer hits the market, it had better have something special going for it, something to set it apart from the mass of similar machines now being produced by nearly every country except New Zealand. Some put forward a particularly cheap price tag; others claim a faster processor or disk drive, or unusual screen displays, or inbuilt printers, or bundled software, or a front panel that looks so much like IBM's that IBM sued.

The Ergo Macro-88 computer is not the cheapest or the lightest of the IBM compatibles, but it does have some unusual features. The Ergo, while compatible with IBM, does not merely copy Big Blue; it tries to improve on him. Its floppy and hard disk drives are above average, as is its display monitor. Its physical arrangement is both efficient and, apparently, very sturdy. Its keyboard, although it is in my opinion a disappointment, is at least innovative.

The Ergo's most important feature, however, is its communications capability. The Ergo people obviously view communications as the great advantage of their machine; it is clear that they take the matter seriously.

The computer supplied to me for review was the Ergo Macro-88/2. It was manufactured by the Ergo Electronics Company in Hong Kong (also called, in some of its documentation, the Evergo Electronics Company). Their Auckland agents, Ergo Computers Ltd, a division of Brandt Corporation, supplied the review machine.

It came with a dual-speed Intel 8088 chip, 512K of main memory, 32K of video RAM, a medium-resolution monochrome graphics tilt-and-swivel monitor, one 360Kb floppy disk drive, one 20Mb Winchester disk, two serial ports and two parallel ports. There were four full bus slots free, plus a fifth short slot. The power supply was a generous 180 watts.

Quality

The first thing that one checks in a Asian-made computer is the quality of the soldering work, which tells much about the quality control in the manufacturing plant. In the Ergo the quality is good, with the joints well-focussed and the tails not too obtrusive. The Ergo people make their own disk controllers, and these appeared to be well-constructed too. The 512Kb of main RAM came in eighteen high-density (256K-bit) chips and there appeared to be enough room for as many more on the motherboard. The fact that there were two more chips than necessary for 512K indicates the presence of some kind of error correction circuitry.

At the right of the front panel, where most clones have two half-height disk drives, the Ergo has room for three. This results in a system box that stands slightly higher than most PC compatibles. The top of the three drives is the Ergo's double-sided, double-density floppy unit. When I looked underneath to see what kind of hard disk I had, I was shocked to find the other two drive slots empty. Could these clowns really have given me a single-floppy machine to review?

Then I noticed the hard disk: 3½-inch Tandon drive, so small that it was mounted vertically, to the left of the three main slots. There is actually room for another 3½-inch drive right next to it, and the half-height slots could still be used for tape units or further disks. The Ergo can hold plenty of mass memory storage, which explains the large power supply.

The only trouble that I encountered with the hardware was with the floppy drive. There is a plastic catch whose purpose is apparently to prevent the user from closing the drive latch when there is no diskette in the drive. It certainly does not serve this purpose any longer: someone had forced the latch down anyway, and it did not look difficult to force. The result was that the broken latch prevented any use of the floppy drive until surgery was performed with a pair of tweezers. In fairness to Ergo, however, it must be said that I was dealing with a demo machine, and it had had some rough treatment – I found a screw rattling around the motherboard as well.

In contrast with some of the early 20Mb hard disk drives, the one in the Ergo gave no trouble whatsoever during a week of thorough multi-user

thrashing with the AMPS operating system. The sticker on the back of the drive reported no bad blocks at all, a fact which the Norton Utilities confirmed.

Keyboard

The Ergo passes most tests of IBM compatibility with flying colours: Lotus, Flight Simulator and Sidekick verify the video routines; Kermit and the AMPS system test the serial and parellel ports, in polled and interrupt-driven modes; Norton Utilities can find no differences with the IBM PC when the processor is switched to slow speed (4.77 MHz).

The only compatibility problem that I encountered was with the keyboard. The Ergo keyboard tries very hard to be ideal, and it nearly succeeds. Unlike most PC keyboards, it has function keys strung along the top, as do most character terminals. It also separates the numeric keypad from the cursor-positioning keys, so there is no need for a Num-lock key.

The touble is that it has a Num-lock key anyway, only it's called, incongruously, "System Reset". If you press it, the system does not reset (unless you hold the Control key down first); instead, the numeric keypad suddenly stops producing numbers and starts moving the cursor around, while the Up-arrow key gives you an 8, the Home key a 5 and so on. If the logic behind this headache is to cater for such programs as Sidekick and Prokey which like to know whether Num-lock is on or off, it fails miserably, since it is precisely these programs that mess up the worst. I have succeeded, for example, in not having any cursor positioning keys at all; everything gave numbers.

There are other less irritating problems with the keyboard as well. The Caps-lock and Scroll-lock keys have no indicators to show when they are on (nor does, of course, the System Reset/Num-lock key). The key layout is nicely sculpted (curved) to minimise wrist strain for fast typists, but fails to go the next logical step, which is to dish the F and J keys so that a touch typist's fingers can know where they are. The keyboard cable plugs into the front of the system unit instead of the side or back, as with most computers; this gets in the way of the keyboard itself.

Considering the effort that Ergo has evidently put into designing an original and useful keyboard, it is sad that the result is actually worse than IBM's.

Microcomputer Summary

Name	Ergo Macro-88
Manufacturer	Ergo Electronics Company, Hong Kong
Microprocessor	Intel 8088
Clock speed	switchable between 4.77 and 8 MHz
RAM	512Kb on motherboard; 32Kb video RAM
ROM	IBM-compatible
Input/Output	floppy and hard disk drives; two RS232C serial ports; two parallel ports
Display	green monochrome medium-resolution screen; RGB, composite or radio-frequency interface
Keyboard	95 full-travel keys; 10 programmable function keys; separate numeric and cursor-control keypads (but see article)
Disks	floppy: double-sided, double-density, 5¼-inch (360Kb); Winchester: 20Mb, 3½-inch
Operating system	MS-DOS V3.11; also runs multi-user and network systems
Bundled software	GW-BASIC
Cost	$5990 (as configured above)
Options	modem card (approx $795); network controller card ($999); various monochrome (green or amber) and colour monitors
Ratings (5 highest)	documentation 3; support 4; ease of use 4; expansion capability 5; value for money 4.

Communications

The Ergo people have clearly decided that the future lies with multi-user and networked microcomputers. To that end they have loaded their machine with features relevant to multi-user computing. The large power supply, the two serial and two parallel ports and the roomy system unit with space for plenty of disk drives and tape backup units, are all appropriate for use with a multi-user operating system or as a network file server.

The Ergo is not afraid to adopt different technologies

In addition, Ergo sells two add-on products that are geared for this same market: a modem card call ErgoCom 1200, and a network controller card.

The ErgoCom card is unique in New Zealand in that it supports both

Another lap-top

Zenith Data Systems has released its entry into the competitive lap-top market with the 5.35kg Z-181 Portable PC. Sporting 640Kb RAM and two 720Kb 3.5-inch disk drives, it is XT compatible with an 80C88 processor running at 4.77MHz, and has a 10.5-inch backlit LCD screen with 80 by 25 lines, 640 by 200 pixels. RS-232C serial and parallel ports are standard, along with an AC adaptor/charger and MS-DOS 3.2.

Local distributor Warburton Franki reports strong interest in the Z-181 overseas, but hopes that supplies will start arriving in New Zealand before Christmas.

Dairy Board goes micro

A contract for the supply of more than 90 Olivetti M24 microcomputers for the NZ Dairy Board has been signed with Compusales as part of the board's continuing development of its Management Information System.

One of the reasons for the choice of the Olivetti, according to board spokesman Robert Nippert, was its micro to mainframe communication. The M24s will be used to collect essential information on products manufactured, their grade, quantity and movement details, and will provide a country-wide network supplying information from factories, warehouses, coolstores and laboratories to the MIS mainframe in Wellington.

the American Bell and the European CCITT standards (New Zealand and Australia also use CCITT), so that, in theory at least, a user may log onto any other IBM-compatible computer and two telephone jack outlets provide a direct connection to the telephone system.

Unfortunately the jack outlets are of the American RJ-11 type, whereas New Zealand uses the British Telecom jacks; this means that you would have to find a cable that has one of each in order to plug the modem into the telephone lines. The modem operates at 300 or 1200 baud and has autodial and auto-answer features. It supports all Hayes standard modem commands except redialing. At the time of writing, Post Office approval for the modem is "pending".

The Ergo, while compatible with IBM, does not merely copy Big Blue; it tries to improve on him.

The network controller card supports Ergo's own network, called Evernet-255. Evernet has a shared-bus topology using baseband transmission on coaxial cable. The total cable length cannot exceed 500 metres (without repeaters) and the transmission rate is three million bits per second. The network resembles, but is not totally compatible with, the Ethernet standard.

The Evernet controller card, like the ErgoCom modem card, is a small one-slot board that plugs directly into the computer's backplane (not necessarily an Ergo computer). The connection to the coaxial cable is through a BNC connector. The networking software supplied by Ergo is claimed to run transparently under MS-DOS, although it takes up 100Kb of the machine's memory.

Neither of these communications products has been properly tested as part of this review; I mention them mainly to illustrate the orientation that Ergo shows toward multi-user computing and inter-machine communications.

Conclusion

The Ergo macro-88 is refreshing in that it does not try to copy IBM or any of the other established PC makers. While compatible with nearly all hardware and software designed for the IBM PC (the only notable exception being programs that watch the Num-lock key), the Ergo is not afraid to adopt somewhat different technologies in an effort to improve the usefulness or reliability of the product, even if that means that the Ergo is not the cheapest clone around.

Good examples of this are the 3½-inch hard disk drive, a more spacious system box, plenty of serial and parallel ports, and specific communications products to address the needs of multi-user operating systems and networks. The only bad example is the keyboard, and even here, Ergo can be given credit for trying.

Save your screens

A software review by Dennis Lally

Direct Access is one of the most pleasant and useful bits of helpfulness you will ever find to put on a PC with a hard disk. I am very enthusiastic about this product, from first testing it and now after two months of regular use.

Direct Access is a sophisticated menu utility for MS/PC-DOS machines with hard disks. It automatically creates menus and sub-menus of the programs installed on the hard disk with minimal input and even less knowledge by the user. Effectively, it provides a front end for DOS which reduces considerably the DOS learning curve for fledgling and occasional PC users. It also benefits the power user by reducing traditional sequences of DOS commands to one or two key presses.

It also provides simple, up front procedures for editing menus and altering the presentation of the menus on the screen. Elementary password protection on menus is available, as is a straight forward batch writing facility. The features of this utility, however, extend beyond making it easier or harder to access programs. There is also a facility to track usage of the machine by date, program, time, user or project or any combination of these. Usage tracking is written to a file which can be viewed or printed – a boon to the administrator of a multi-user machine, and a must for the part-time user-owner who needs evidence of the proportion of business use of his machine for tax purposes. A further feature is a screen save facility.

Replace DOS?

Direct Access will save time and money in an office situation by reducing the DOS skills needed by users. You don't need a local expert to set up Direct Access. With the 30-page manual in hand, a novice will create a menu system in half an hour that would be the envy of any of any PC pro. It does not, however, replace DOS. In fact, one key press from the main menu screen [F10] immediately exits into DOS. Thus Direct Access does not inhibit disk housekeeping or the use of the more obscure DOS commands utilised by the advanced user.

Nevertheless, many DOS commands can be automated within the menus and given meaningful names, even phrases, such as "Completely backup Hard Disk" rather than their cryptic *COM titles. No more syntax errors. Of course it is possible to do menus under DOS using EDLIN and TYPE commands and creating batch files, but it is much easier to use Direct Access and the result always looks better and always performs better since you can arrange programs to load with only one key stroke. Direct Access makes the [Return] key obsolete for confirming commands.

Novice users surprise themselves at what they can do immediately

Treed directories

To set up a Direct Access menu, the user will need to have first created subdirectories on the hard disk and loaded them. This is not difficult even for the beginner, once the concept of treed directories is understood (like manilla folders inside file folders). These days most major software packages have an install program

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which creates the required subdirectory and loads the necessary program files to it. All the user needs to know is what the subdirectory is called and what is the command to start the program loading.

To create a menu in Direct Access the user presses [F1] to modify the menu, then submenu headings can be typed in. Multiple word titles such as 'Word Processing' or 'Graphics Packages' can be used as headings for the submenus. From modifying the main menu the user then selects a sub-menu to modify. The submenu form asks for a descriptive name for the program, the drive ID (normally C), the subdirectory and the command.

So for Microsoft Windows you could type: Start Windows, C, windows, win. That's all there is to creating a menu entry. You simply escape back to the main menu and select the a,b,c or whatever letter precedes Start Windows, and Windows will start up. When you quit Windows or any application you are returned to the menu automatically – no batch file to write or go wrong.

Cheerful messages

All controls in Direct Access are easy and straightforward. Novice users surprise themselves at what they can do immediately, and experienced users find that the manual often remains unopened. The same [F1] key also allows access to a settings screen, which allows simply off/on selection by cursor, such controls as menu, text and background colours and brightness. Also personalised menu messages can be composed to greet you and reassure you throughout the day. As well, screen blanking can be turned on or off and regulated to activate after from 1 to 45 minutes of screen inactivity.

If you have an IBM AT this is a real boon; this is the first bit of software I've seen which will do a screen blank on an AT. When you consider what an EGA display costs and how long even a moderately busy AT will be displaying its menu, the last thing you want is to burn in the menu on the screen.

The nice touch about the screen blank feature is that is works only when the menu is showing, so an intensive period of gazing with furrowed brows over some complex spreadsheet is not going to be interrupted by the screen suddenly going blank. Likewise a blank screen indicates a machine not in use, so a potential user need have no qualms pressing the space bar and reactivating the menu.

Meanwhile, the astute manager will have arranged for the Usage option to be functioning at all times with the user name option turned off so that the Usage program is running unobtrusively underneath, recording which programs were used at what times and for how long. By this means a manager can see how much use a machine is getting and have the statistical information which might justify another machine or a reappraisal of the existing one. Similarly, the most used software will be clocked, as will the least used. This could aid decisions on subsequent purchases or on which programs to maintain on disk if space becomes a problem. Access to the Usage feature can be password protected if required.

The individual owner will find that the customising features allow you to make your computer truly personal and much more friendly. Instead of writing batch files, command lines can be written for the subdirectories. You can also write prompts in your own friendly words for programs which will require a floppy diskette before executing. Passwords can be specified for any or all applications, even exiting to DOS should this be disirable.

Last, but not least, you can write your own greeting or notice to be displayed on the main menu. In conjunction with the program's own "Good morning.. or afternoon or evening" depending on the time of day, Direct Access certainly makes the effort to be friendly.

Summary

Direct Access is a small package in size (15Kb RAM) and moderate in cost, about $200. It will run on any IBM PC, XT, AT or compatible with at least 128 KbRAM. It works with colour or monochrome monitors and requires PC/MS-DOS 2.0 or higher. Like all enlightened software these days, Direct Access is not copy-protected. It is as friendly a utility as you will ever get for a PC – until we see how Microsoft's DOS-286 comes out. New PC users may never need to confront a C prompt (C>) thanks to Direct Access, and for that they will be better off because they will be using the PC productively all the sooner.

For a menu utility Direct Access has some powerful extra features. The screen blanking feature alone will repay the cost of the product if you have an AT. I've recommended Direct Access be installed on every AT in our firm and justified the cost on saving an EGA display worth 10 times the price of Direct Access. That feature alone persuaded me that this product was a 'must have' as well as a 'nice to have.'

(Direct Access by Delta Technology. Supplied by PC Power, Lower Hutt.)

TIME USAGE TRACKING REPORT

09-29-86 9:12a — Page 1

Sorted By Date & Time

DATE	TIME IN	TIME OUT	TOTAL TIME	APPLICATION NAME	PROJECT NUMBER	USER NAME
9-19-86	10:44a	11:48a	1:04	Symphony	1	DENNIS
	11:48a	12:04p	0:16	IRMA 3270 terminal	1	DENNIS
	12:05p	12:50p	0:45	Format Diskette In A	2	DENNIS
	12:51p	1:10p	0:19	IRMA 3270 terminal	3	DENNIS
	2:13p	2:31p	0:18	IRMA 3270 terminal	3	DENNIS
	2:36p	3:51p	1:15	Backup Entire Hard Disk	3	DENNIS
	3:52p	3:52p	0:00	DOS Activities	3	DENNIS
	3:53p	3:57p	0:04	Symphony	3	DENNIS
	3:58p	4:00p	0:02	Menu Maintenance	3	DENNIS
9-22-86	8:26a	9:19a	0:51	Symphony	1	MEET PREP
	2:39p	5:36p	2:57	Symphony	1	MEET PREP
9-23-86	8:29a	9:04a	0:35	DOS Activities	1	DENNIS
	2:02p	3:35p	1:33	Symphony	1	DENNIS
	3:41p	3:51p	0:10	Menu Maintenance	2	D
	3:53p	4:25p	0:32	Symphony	NONE	NONE
9-24-86	8:47a	8:49a	0:02	IRMA 3270 terminal	NONE	NONE
	9:05a	9:33a	0:28	Symphony	NONE	NONE
	9:33a	9:38a	0:05	IRMA 3270 terminal	NONE	NONE
	9:41a	9:44a	0:03	IRMA 3270 terminal	NONE	NONE
	12:08p	1:06p	0:58	Symphony	NONE	NONE
	2:22p	5:43p	2:21	Symphony	NONE	NONE
	5:43p	5:50p	0:07	DOS Activities	NONE	NONE
	5:58p	6:01p	0:03	Symphony	NONE	NONE
9-25-86	3:12p	5:40p	2:28	Symphony	NONE	NONE
9-26-86	10:54a	10:54a	0:00	DOS Activities	NONE	NONE
	10:55a	12:54p	1:59	Backup Entire Hard Disk	NONE	NONE
	2:18p	2:26p	0:08	Symphony	NONE	NONE
	2:50p	3:02p	0:12	DOS Activities	DENIED	NONE

Sample of Usage Reporting examples of project number and user name required; and later, no input other than passwords.

CONFIGURATION

Current Log File Name ..... [USAGE]
Computer ID ..... [dvIXT]
Enter User Name? ..... [Off]
Enter Project Number? ..... [Off]

Report Defaults
Main Title ..... [TIME USAGE TRACKING REPORT]
Sub Title ..... [ ]
Start Date ..... [01-01-86]

LOG FILE STATUS

Creation Date 09-17-86 Total Entries 53 Size 3280

F10 Save & Run Main Menu Esc Save/Exit

Example of pressing D in Menu Maintenance. Usage Tracking controls and options.

CREATE / MODIFY SUB-MENUS

The Title Of This Sub-Menu Is DOS Utilities

PROGRAM DESCRIPTION	DRIVE	DIRECTORY	FILE NAME
A) Format Diskette In A	c	dos	format a:
B) Drive A Diskcopy	c	dos	diskcopy a: a:
C) Backup Entire Hard Disk	c	dos	backup c:*.* a:/s
D) Copy A File	c		copy &
E) Space On Hard Disk	c	dos	chkdsk c:
F) Wildcard	c		&
G) Weekly Backup	c	dos	b
H) Monthly Backup	c	dos	c
I) Move Machine	c	dos	d
J) XTREE	c	dos	xtree

F1 Insert F2 Delete F3 Move F5 Custom F10 Save & Run Esc Exit

Example of pressing B in Menu Maintenance. Note that the program description is all that appears in the sub-menu, and that simply pressing the corresponding letter initiates the file command. In this instance some file names are batch files from a traditional menu now incorporated in Direct Access.

The fingers that launched a thousand slips . . .

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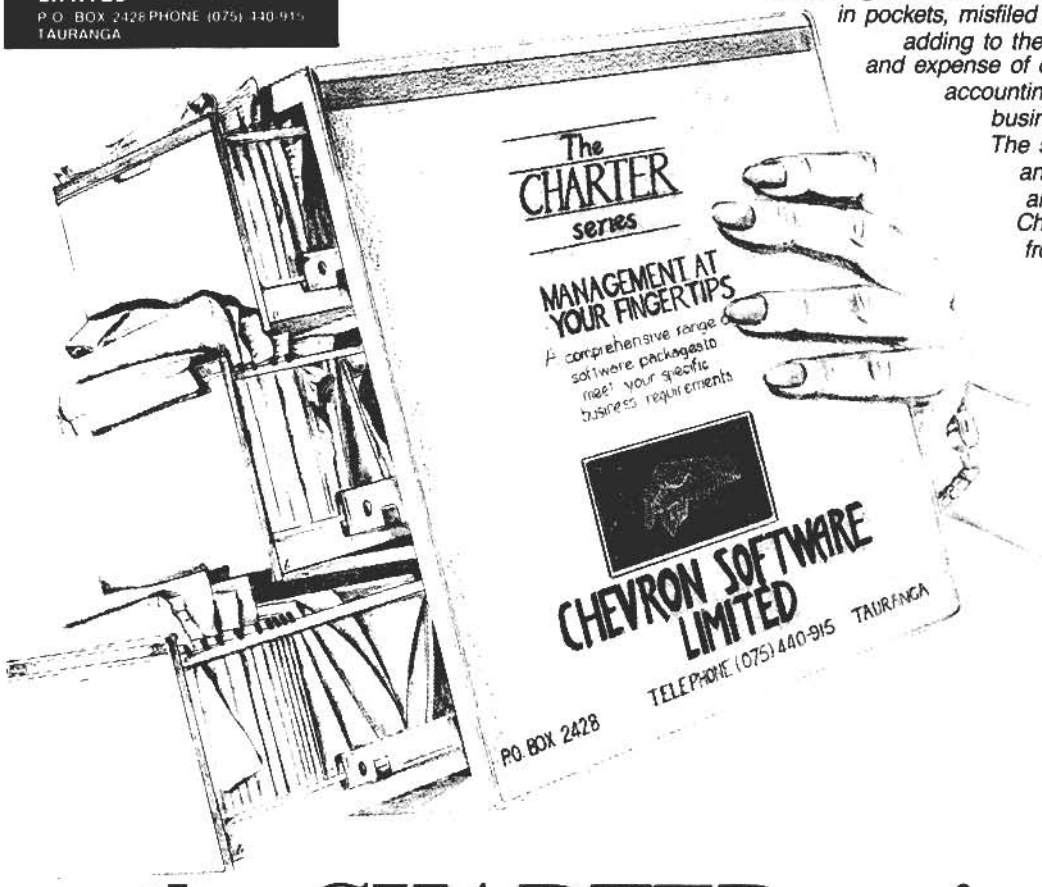

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Scuttling the pirates

In this regular column we keep the business person in touch with developments in the microcomputer industry.

The research reports are prepared by Jenny Peacocke, Grant Furley and Phil Ashton at KMG Microlab, an independent consultancy established by the accountants KMG Kendons in Auckland.

With the upsurge of computerisation, new Zealand has witnessed a new type of crime – software piracy. This romantic description camouflages a sordid crime, the theft of copyright material.

Different methods have been tried to prevent piracy. One that frustrates the user more than the pirate is copy protection (designed to make the disks unable to be copied). While the legitimate users have problems making backups for their own safety, the pirates have usually designed a way around the copy protection within days of release.

Another method is licence or security numbers designed to limit important aspects of the program if the correct combination isn't entered. This allows purchasers to make backups of their disks, but any pirate with a bit of patience and a good decoder program can work out the system behind these numbers.

While it may seem worthwhile at the time to buy pirated software at a fraction of the retail price (or at no cost), there are serious pitfalls for the users.

Moves are afoot to bring in retroactive legislation making it much easier for the software owners to bring action against illegal users of their programs. So watch out. Pirated software users from last year may well be taken to court and fined large sums of money next year.

A more immediate worry for the users of pirated software is support. Even the best software isn't guaranteed to be bug free, but a legitimate user has the backup to fix any problems that may arise, and automatic access to any new releases of the product. The users of pirated software cannot contact the softwarehouse to solve any problems that may arise (at least not without leaving themselves open to a bill for the cost of the software and maybe a hefty lawsuit) and could lose large amounts of valuable information, with absolutely no comeback.

They could also find themselves left behind when major updates occur to the software package. While software houses will contact legitimate users to give them details of a new release and usually offer the upgrades at a nominal fee, the illegal user can be left with an obsolete package.

If you are looking for a software package and are given a choice of legal or illegal software, consider the implications before you buy. Do you want to leave yourself open to the possibility of losing months or years of valuable information? Do you want access to any new features of the program? Are you willing to have to defend yourself in a possible lawsuit?

Remember, software piracy is theft.

For the relatively low cost of software today it is easier, safer and cheaper in the long run to purchase a legal copy of the program from a legitimate dealer.

New face in the PC software scene

We thought there was a sufficiently wide range of business accounting software on the market, but Power Software must have felt otherwise. Or perhaps it is going to add another dimension to the type of product already here. If that dimension involves improved service to dealers and installers, then it may well succeed.

Power Software has its origins in New South Wales and has appointed a NZ support representative, based in Birkenhead, Auckland. Their software has been available in New Zealand, but now they are intent on raising their profile. Do we read into this that they believe their product is now sufficiently stable to proceed with a full scale launch?

Their software includes debtors, invoicing, sales analysis, inventory creditors and general ledger, and some obvious benefits of power Software over comparaible products include:
a report generator with each module; tailored menus to suit users; multi-company processing; comprehensive password control; and tailored data entry screen to suit users.

Power Software have modified systems designed to suit private schools, insurance brokers, and veterinary services.

We should add that we have not spoken to any users and therefore cannot comment on product reliability and support.

A plug for database products

There are many good databases on the market, but most people, while they happily go out and purchase their accounting, wordprocessing and spreadsheet software, are more hesitant about buying a database. Many computer owners do not seem to appreciate the variety of uses they can make of a good relational database or the wonderful management and planning information that can be retrieved from being able to pick and choose any different combination of their data.

Databases have been used for such varied applications as real estate rentals and sales, membership lists and billing, car sales, quoting and stock tracking, as well as the common uses of client and mailing lists. Any application collating large amounts of similar information with the need to withdraw and examine selected parts or results of that information can make use of a database.

The ability to set up base files (customers, stock, houses, etc) with the information YOU want (instead of what the programmer tells you is needed) and to access that information from separate transaction files means that you can even set up a simple debtors and inventory invoicing system.

You can then print out reports showing such things as:

- all red, four-bedroomed houses on the north side of the streets in Pakuranga between $90,000 and $135,000 with a swimming pool;
- all customers spending over $50,000 per year who have not purchased anything for two months;
- total costs incurred to vehicle (purchases, petrol, grooming, registration, etc) to give a true cost price and profit;
- outstanding quotes not accepted after 10 days;
- all clients you promised to contact this week;
- or any other combination of your information.

This type of management tool can be used by all businesses to give ready access to statistical or current information which can be used in market planning and advertising or to provide a more efficient service to clients.

Computer users accept the power a spreadsheet can offer for working with figures and a wordprocessor for working with words, so it is time people started looking at databases to improve their information processing.

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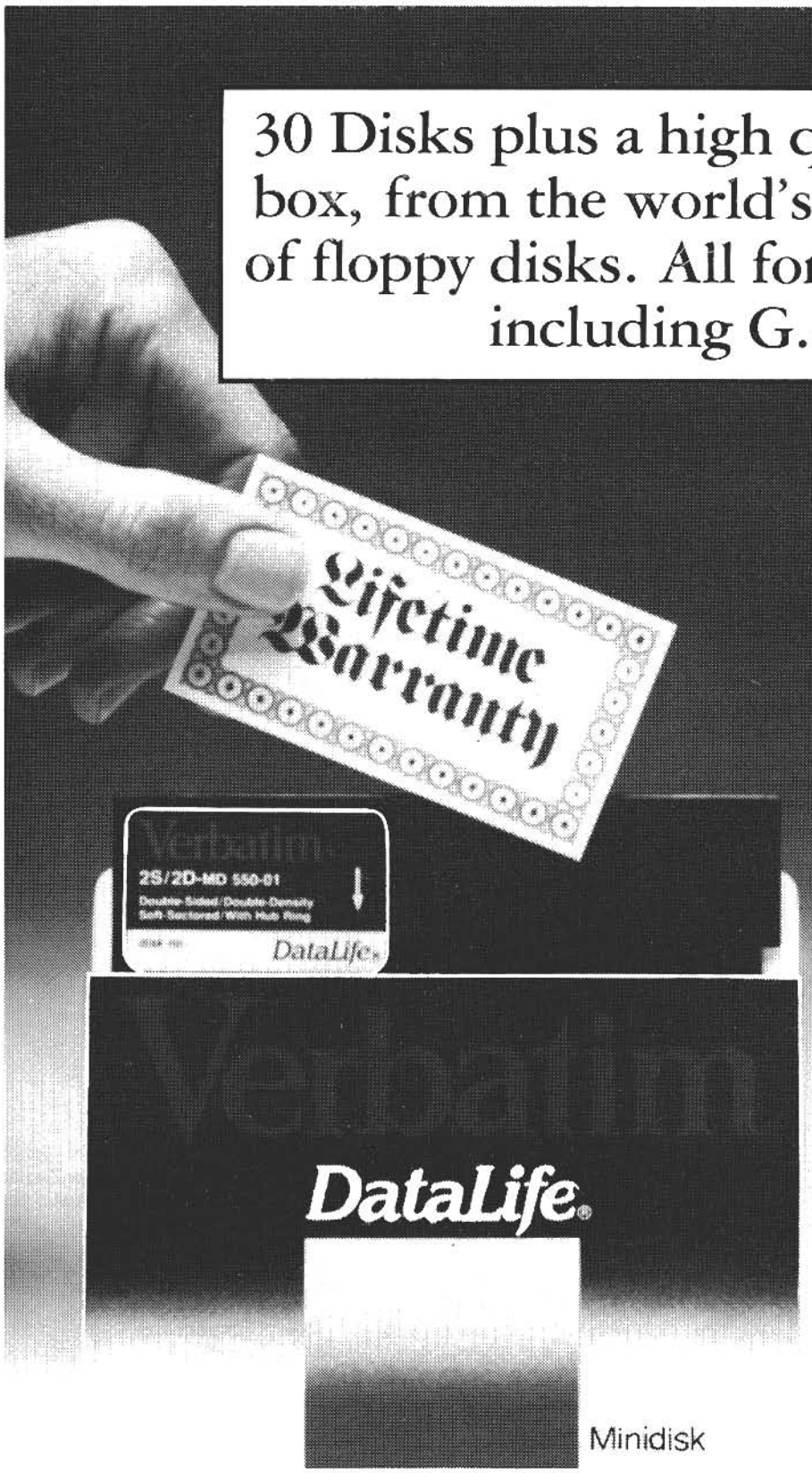

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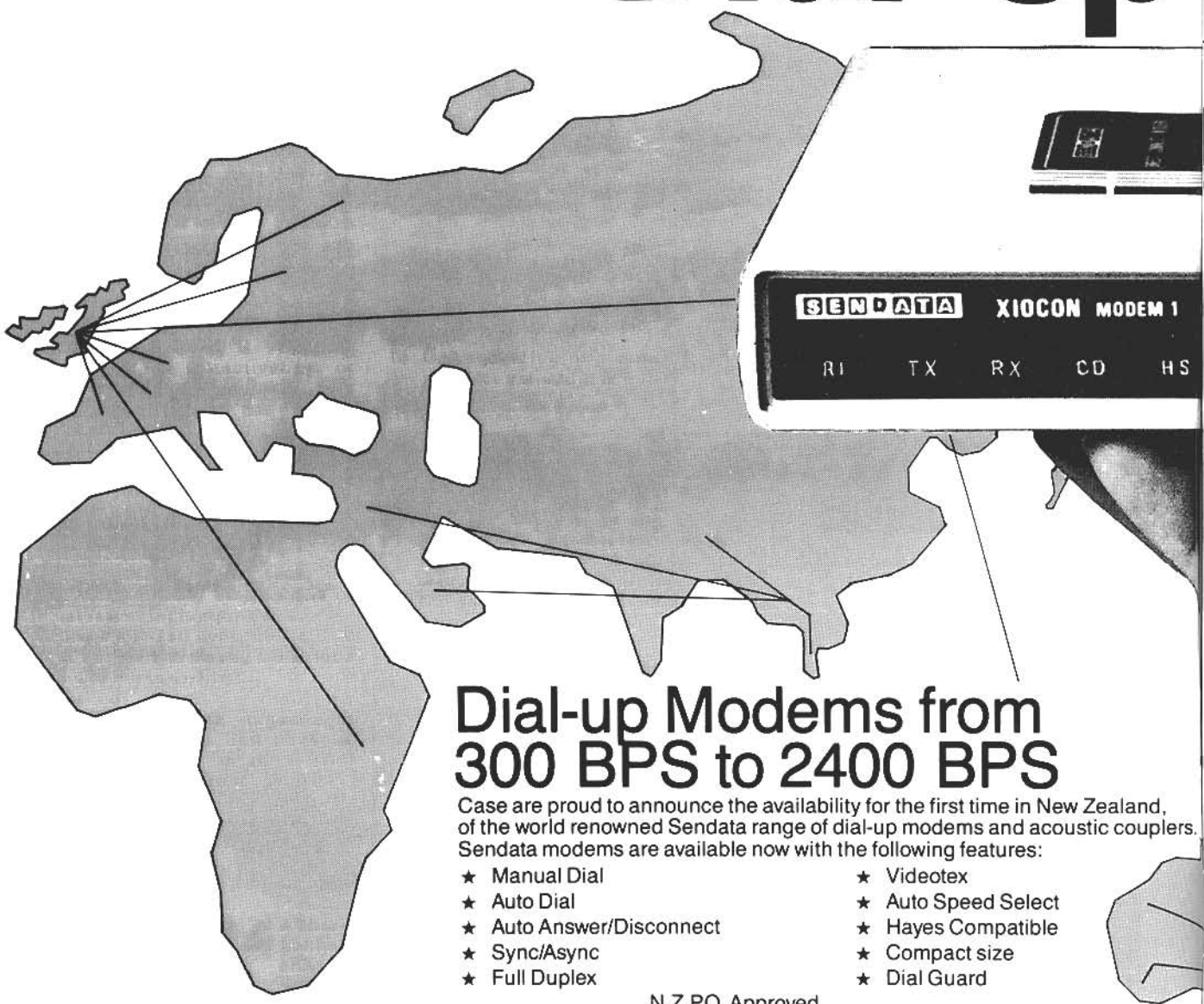

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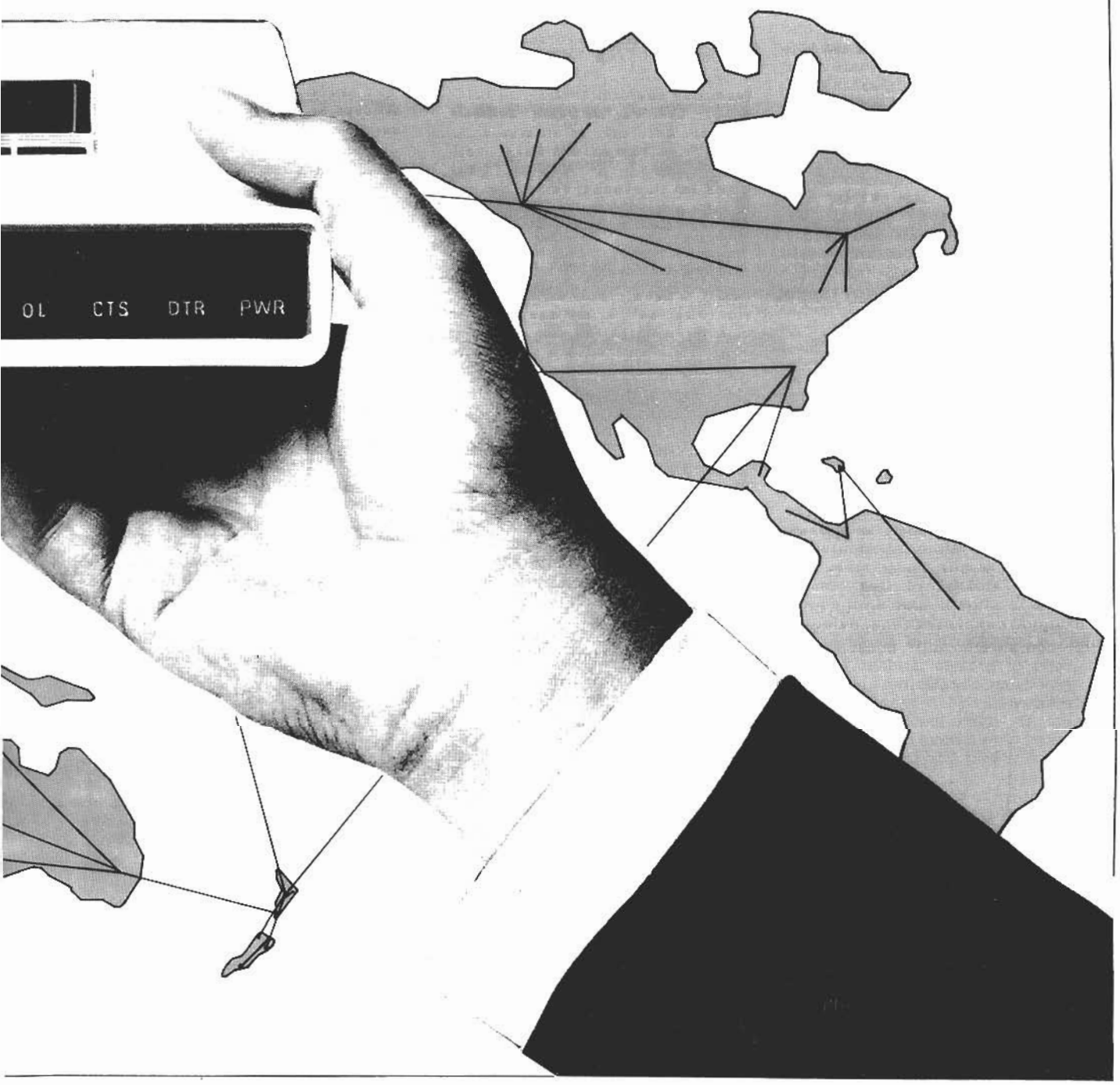

It's a 64, see? by Joe Colquitt

The 64C from Commodore is a new-look addition to the well-established line of Commodore home computers, which ranges from the PET to the recently released Amiga. Commodore boss Terence Rattigan continues the push on the 8-bit front, aided by the impetus of GEOS, reviewed recently.

Further to that review, a *GEOS Programmer's Reference Guide* is due for USA release in December 1986, while more printer drivers, fonts, and geoBASIC are being worked on. Software correction information for GEOS/Riteman C+ operation is available from myself or Commodore.

GEOS will also be available for the 128, initially on disk, but considerations are rumoured for an EPROM version that could plug into the empty ROM socket addressed as bank 4. This would give the 128 a fourth personality (64, 128, CP/M and GEOS), and a fifth (IBM) has been announced by SOGWAP Software (Venice, Calif). 'The Big Blue Reader' can read/write MSDOS, Commodore and CP/M formats, opening up all manner of programming and functional possibilities.

The 64C is electrically and functionally identical to the familiar 64. The user, serial, expansion, cassette, joystick and audio/video ports are all there. The difference is the packaging, in the same vein as the 128 series. Black characters on light beige keys, in a slightly darker surround, give the 64C a much sleeker appearance.

Until now, the 64 has been in a case which looks and feels a bit chunky. Its new styling is far removed from that, being more wedge-shaped. The angular lines, once seen only on office equipment, change the character of the computer, and possibly the attitude of a user familiar with ol' chunky. I actually felt more motivated to work on the 64C, even though it's exactly the same inside as the 64. A reset key would have been nice, after all the effort put into the new styling. Perhaps one day...

Compared to the old 64, measuring 2310mm (D) by 405 (W), the footprint of the 64C is slightly bigger, 245 (D) by 413 (W), and sits about 1cm lower. The keys stand 0.5cm more proud than on the 64, well-sprung and sensitive, providing tactile feed-back. The ventilation grill between the keys and the back of the unit has deeper slots than before. Whoopee-do, you think, but I found it extremely useful for standing disks in when backing up files, or using a multi-disk utility (disks warm up more if they sit in the drive for the same time). Surely an unplanned, but much appreciated, convenience. A piece of stiff card in one of the slots can act as a paper support.

The new Commodore 64C with its thick 'n chunky predecessor.

Gone is the rainbow and Commodore logo, replaced by a small inset label, front right, which reads 'Commodore 64 Personal Computer', as on the 128/PC10/PC20. A red LED power indicator is the only part of the case that isn't some shade of beige. The power supply has also been restyled in beige. TV drive is from an internal modulator, which keeps things tidier and gives a cleaner picture.

The 64C provided was part of a Family Pack. The hardware comprises a standard C2N datasette and two Commodore C1342 joysticks. These are much improved on the old VIC joysticks, and have a very nice, smooth action. A pair of responsive paddles was an unexpected bonus.

Software in this set included two cartridges, Le Mans (had my first go on that for years!), and International Soccer, together with Arnie's Armchair Cricket/America's Cup on tape. Both tapes had excellent signal strengths with no loading problems, matching the C2N head alignment perfectly. The range of game skills needed should occupy young minds of all ages. Le Mans is for everyone, through to America's Cup, which requires a fair bit of nous to play properly. Far more challenging than a selection of shoot-'em-ups.

Systems Guide completes the package, a vast improvement on the *User's Guide* that accompanied older 64s. It comprehensively covers the hardware, keywords, and has many programming examples, covering the aspects of BASIC. *Systems Guide* provides the buyer with enough informative reading to keep her/him busy understanding the computer, without the immediate need for more specialised books.

The 64C seems to be a good move by Commodore. Many products have sales stimulated by improved looks, and presumably computers are no exception. The 64C and restyled 1541C drive have an appeal to them. Not content with that, monitors have also had a facelift (screenlift?). Seen at the latest Summer Consumer Electronics Show in Chicago were the restyled 1702 (now 1802) and the new 1902A. This accepts composite/digital RGB, and can be switched to a green screen.

With GEOS, 512KB RAM pack and 1902A, you'd have an attractive home/business setup. Production of the 64 was halted twice in the last year or two, but retailer pressure resulted in output resuming. Even with eight million sold world-wide after four years, the demand is still there, and deservedly so.

Family Pack: Commodore 64C, C2N Datasette, two joysticks, two paddles, four programs, *Systems Guide*, $765 (inc GST). Disk Pack: Commodore 64C, 1541C drive, joystick, GEOS, The Manager, $1295 (inc GST).

Review system supplied by Commodore Computer (NZ) Ltd, Takapuna, Auckland.

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MS-DOS programmes are aimed at the IBM-PC and close compatibles. The NEC APC III will often require the software library extension card to be able to execute these programmes.

Documentation is included on the disks where required — often it is very extensive. Unfortunately, we are unable to provide telephone tutorials on using the programmes.

MS-DOS disks are formatted for standard MS-DOS 2.11 360K. Testing has been carried out for CP/M disks on a Z80 Kaypro II.

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M34: MULTI-TASKING SHELL. On this disk we have two excellent DOS Shells which allow you to operate and execute from a menu system — Dosamatic and Still River Shell. Interrupt tasks and switch to other programmes. Enjoy a superior work environment.

M35: CP/M EMULATION. Run CP/M software on your PC! Well documented and source coding is provided.

M36: SUPER DISK CATALOGUER. This is a superior capacity disk cataloguer that will put order into your files, print listings, locate files, give directory printouts, etc. Ver. 1.3.

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M51: STYLE ANALYSER. Examines text that you've written and suggests ways that you can improve written expression.

GRAPHICS

M65: SPRITE GRAPHICS. Lets you create sprite characters from a set of coloured pixels for your programmes. It is self-documenting and contains a sample file. Allows you to display the figure in one step.

M66: EXTENDED FONT CHARACTERS. PC-FONT ver 2.04 is a utility for Epson-compatible printers that will print all of the printable characters of MS-DOS character set — including block graphics, engineering and scientific, foreign language, etc. Control the size, style, density, linespacing, etc. Have solid underline and vertical lines. Gives a more professional output.

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M107: BULLETIN BOARD LISTING. A comprehensive list of Australian Bulletin Boards. Text files are available in a variety of disk formats.

M108: COMMUNICATION — QMODEM ver 2.0E. A popular programme for modems. Has installation programme. For communicating with bulletin boards. An update.

M109: COMMUNICATION — KERMIT ver 2.28. An updated version of this well-known programme for communication with bulletin boards and other computers. Has source code.

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M152+: RBASE LOOKALIKE. A three disk set of a powerful, sophisticated database management programme (PC-RIM — Relational Information System ver 5). Operates as standalone system in both menu and command modes or will drive application programmes. Has natural language query system. Extensive documentation and help files. $54.

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M203: MATHS TUTOR. A Basic programme that suits primary classes. Has six grades of arithmetic training.

M204: PC-TUTOR. Learn more about the operation of your computer, the important commands, etc.

M205+: SPELLING AND VOCABULARY. Suits high school*. Contains 7500 words, but not the most common 4000 — the next most commonly used words. Compiled, with Basic source code included. 4 disk set for $45 instead of $60. American spelling can be changed.

M206: HISTORY EDUCATION. A Basic educational game that teaches history. An adventure approach that wins/loses gold, has time warps etc. American conditions but questions can be changed.

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Price 35c Tuesday, October 7, 1986 Telephone

New Mace + Utilities Restores Lost Files With Consummate Ease

By Our Computer Correspondent

Computer people, long accustomed to being in the vanguard of technological progress, have become pretty blase about new advances in their own field. But the new Mace + Utilities has managed to cause an uncharacteristic stir in PC circles.

PC users are only too familiar with the hazards of faulty or worn disks and with the frustrations of untidy files and directories.

Traditionally, the only means of overcoming problems of this nature was tedious re-programming. Such keyboard drudgery was always exasperating and time-consuming, and hence costly. Thanks to Mace + Utilities it is now history.

Mace + Utilities is an ingenious programme that acts a bit like a sheepdog and a bit like a filing clerk: it rounds up lost data and restores order to messy records. This is how it works:

Unformat
will restore all your subdirectories and files automatically on a hard disk.

Undelete
gets erased files back with four keystrokes and without cross-linking.

Remedy
automatically moves files to a safe place and locks out the bad spots.

Reclaim
automatically extracts files from unreadable disks.

Condense
un-fragments up to 32 mb, doubles the speed at which programmes load, find, and store data, by placing files in one physical piece on the disk.

Squeeze/Sort
in a single operation — speeds up the path by squeezing deleted references from directories.

The question smart computer people should be asking themselves is: Have I honestly got the time to do my disk/file maintenance when Mace + Utilities can do it for me in a fraction of that time? This correspondent thinks not.

Mace + Utilities is what computers are all about —taking over routine functions so that inventive minds can concentrate on more creative, exciting, and lucrative tasks.

This amazing programme comes from the United States and is available in New Zealand only through Mailorder Systems Limited. It costs $249.00. Courier, handling, and insurance charges are included. Send off the coupon today and find out what the fuss is all about.

Kevin Craddock, a delighted Mace + Utilities user. "How on earth did we ever manage without it?" he asks.

Australia Divided Over National Logo

In Australia, a normaly sleepy South Pacific country brought to prominence by the America's Cup, a fierce battle is raging over the question of a national symbol.

Just as the kiwi in New Zealand has come under threat from other would-be logos, so the kangaroo no longer reigns supreme on the other side of the Tasman.

There is a need, they feel, to promote Australian derring-do in a more modern way. Individual initiative should be seen to combine with up-to-date technology for optimum effectiveness. That is why they want Australia to be represented by the Combat Wombat.

Insults

Both camps are receiving a lot of media attention as well as support from the general public. There have been demonstrations in the main cities, a number of them not entirely peaceful. Housewives, some with shopping bags, have been observed hurling insults at demonstrators.

Federal ministers have started to express concern at the divisive nature of the issue. "Let's get it settled once and for all," said one. A referendum is being planned for a Monday later this year, if such a day can be found when there is not a holiday in one of the states.

Fuel From Weeds Soon Reality

Science Reporter

Construction work on the new synthetic fuel plant at Taihape is due to start early next month. The plant, which will convert weeds into fuel for internal combustion engines, should be fully operational within two years. Total cost to the taxpayer and unsuspecting foreign investors will be in the region of $150 — $900 million.

The weed conversion process was conceived, developed, and published in paperback at the University of Taihape. The fuel it produces is green in colour and will be known as New Zealand Green (NZG).

The octane rating of NZG will vary with the type of weed used. It is envisaged that petrol station pumps will show the names of the relevant weeds so as to avoid confusion among motorists. An industry spokesman says that all types of vehicle will be catered for, from Skoda (gorse) to Lamborghini (puha).

The scientist in charge of NZG at the University of Taihape is Dr Vial Meniscus. He says that much of the initial research has been carried out quite literally in the field, that is in farmers' paddocks.

"The farming community has been wonderfully cooperative," continues Dr Meniscus. "And don't forget that, as other types of farming take a dive, weed growing could provide a welcome cash flow relief in the rural sector."

Sturdy and workmanlike

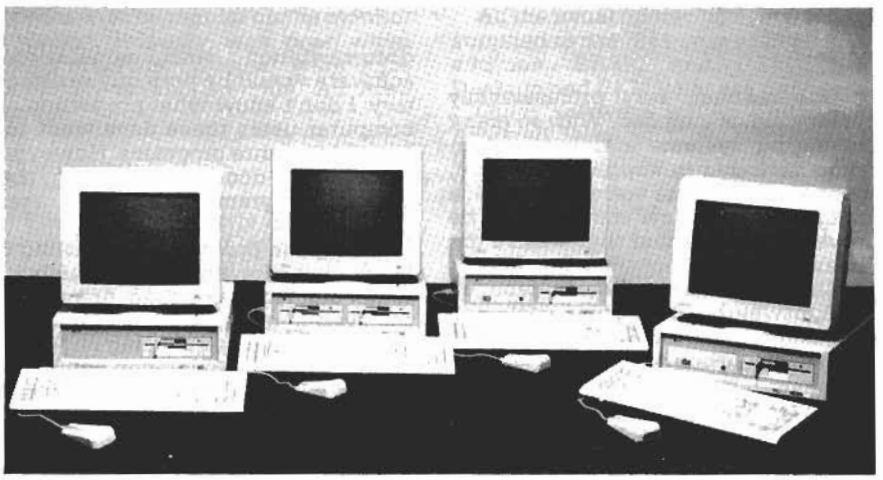
by John Slane

Amstrad is a late entry into the competitive field of IBM work-alikes, and no doubt there will be many other rivals yet to arrive. IBM itself is probably not far off turning its back on the 8086 family, as having bred the progeny it finds itself being undercut by the upstart adolescents.

With the arrival of the extraordinarily cheap Amstrad PC 1512 there's even more reason for IBM to throw its resources into another yet unexploited field. (Macintosh, Amiga and Atari – watch out!)

The typical Amstrad strategy with both 8- and 16-bit machines is to take a proven technology and something with a solid software base. Then it identifies suitable combinations of hardware to put together a package which offers convenience and functionality while not having any special brilliance about it.

The selection of an odd sized mini-disk and a low-resolution colour screen (which makes 80 column print illegible) probably had more to do with cost-cutting on the 8-bit machines than good functional design. Perhaps Amstrad had some useful feedback on this, because the one characteristic that stands out with the new PC is that the design is right down the middle.



The mono-screen range of Amstrad 1512. From left: single floppy, double floppy, 10Mb hard disk, and 20Mb hard disk. The colour screen option for each brings the total available range to eight.

The Amstrad PC

Amstrad has tried hard to make sure that its PC is as much like an IBM as possible, together with IBM "extras" that come as standard on the Amstrad PC.

The keyboard, for example, is about as IBM as you can get. Amstrad didn't take the risk of shifting the cursor keys off the numeric keypad and putting them sensibly on their own keys. On balance, however, there's nothing cheap and nasty about the keyboard, either. The keys have a solid and reliable feel. I've used far worse keyboards on much more expensive machines.

The review machine was the dual disk version using standard 5¼-inch 360Kb floppies. All versions have 512Kb main memory (expandable to 640Kb) and the 8086 processor at a clock speed of 8MHz. Buyers can select specific models with just one disk drive or up to a 20 Mb hard disk, which can be installed in the computer itself.

As mentioned earlier, the Amstrad PC1512 comes set up with most of what you will probably want – graphics and colour boards, mouse, joystick port, sound, Centronics and RS232C sockets, and plug-in provision for 8087 maths co-processor.

A feature I really welcome is the battery-backed real time clock. It should be compulsory for all computer manufacturers to install this as a standard feature! Not only does this save entry of time and date when you switch on, but on power-up the Amstrad tells you when the computer was last used – a sneaky way of finding out if your children have been playing games on it while you were out doing the shopping!

Monitor

I give full marks for the excellence of the monitor setup. It is tilt and swivel, and is designed to sit securely within a recess on the top of the processor cabinet. When in place it covers the open pocket for the clock batteries. You could quite safely carry the computer plus monitor from one office to another without fear of dislodging the monitor.

As with the 8-bit Amstrad models, the main power switch for everything is on the monitor.

As with the 8-bit Amstrad models, the main power switch for everything is on the monitor.

The monochrome version uses white phosphor, not my preference, in spite of Macintosh trying to make this respectable. I much prefer green or amber, and certainly wouldn't choose full colour unless games or business graphics were to be a predominant use.

Mouse

Good news for left-handers! The cable comes out from the left of the processor unit and provides a bare minimum of action space if used to the right of the keyboard. Good news also that it is a double button mouse, very sensible if the software knows how to make use of the right-hand button.

A separate socket is installed on the back of the keyboard for a joystick.

Supplied software

Amstrad is making every effort to convince buyers that this machine is a direct alternative to an IBM PC. The systems disks cover all the parameters of anything ever written for IBM, with DOSs for Microsoft 3.2, PC-DOS, CP/M-86, DOS Plus 1.2 and GEM 2.0.

Four standard disks are provided, and all are just about full. One of the first jobs for the new purchaser is to pull off the appropriate systems on to applications disks to make room for data and other programs.

A significant amount of space on the disks is taken up with various programs running under Digital

Research's GEM – mouse-driven windowing programs. These include the main management programs and Desktop, GEM Paint and GEM based Locomotive BASIC 2. Unfortunately no wordprocessing or data base is included as bundled software.

Manual

One manual, very professionally presented, is supplied. With so many operating systems and some programs included in supplied software, the manual writers were faced with a daunting task. How could all this be covered in a manual that wasn't too heavy to lift?

The option chosen was to produce a lightweight discourse, with the main emphasis on GEM, to at least get the first-time user started.

I found it immensely frustrating because things I wanted to know were hard to find – if there at all. Any serious user who was not merely running complete software applications would have to buy a great deal of supplementary material – the separate manual on Locomotive Basic would be an example. The supplied manual is useless to anyone wanting to write programs in this particular basic.

For those people not interested in writing their own mini-programs, the documentation with applications software would be perfectly satisfactory. I don't know what proportion of computer users these days want to, or need to, write programs. However, inadequate documentation of the system programs can be a real hazard.

Inadequate documentation of the systems programs can be a real hazard.

During the process of formatting a blank disk, for example, I inadvertently named the wrong drive, and the system busily formatted the program disk. I'm used to using an "intelligent" DOS which *never* formats a disc containing data until asking for, and confirming, this direction from me.

Up and running

As with many machines, Amstrad cautions you not to turn the power on or off with discs inserted. Also like many other machines in this class, the Amstrad begins with a diagnostics test, but as mentioned earlier, with no requirement for date and time.

Alan Sugar, chairman of Amstrad Consumer Electronics PLC, with the new PC 1512 which retails in the UK for £399.

If you follow the manual's suggestions and start with Disks 2 and 3 you will (eventually) arrive at the GEM system.

I described the GEM enviornment in a recent review of the Atari ST (August 1986, *Bits & Bytes*). The Amstrad version is not a great deal different – except, of course, the much inferior screen resolution and slower speed. I would expect this comment to apply to virtually all computers in the 16-bit class, but if you haven't seen the Atari ST version first, you will probably be well satisfied with what is offered for the Amstrad.

The aspect I find most disappointing is the relatively unsophisticated facility for file management. On the plus side, the little I was able to learn from the manual, supplemented by some creative experimenting, brought me to the conclusion that Locomotive Basic in the Amstrad version is rather better than is offered for the Atari.

Screen presentation

I give high importance to the quality of screen presentation since that is what the user will be looking at all day. The Amstrad PC rates about 5 out of 10 for clarity of text.

Under GEM, characters are presented as reverse video – black letters on a white background. Because of the coarseness of the scanning lines, characters are broken up and given a disjointed appearance. This is exacerbated by the standard character generation mode which uses pairs of pixels to draw each letter, and it would have been much better to use single pixels to outline characters. Standard letters under the usual operating systems (white on black) are marginally more acceptable.

Although the scanning lines appeared to be regular on the monitor supplied, linearity was poor when using graphics. "Circles" were quite obviously ovals on this Amstrad screen.

Operation

The system clearly operates as would be expected for a machine which sets out to emulate an IBM PC. There are no grounds to doubt its high IBM compatibility.

It is logical for Amstrad to use a faster (8 MHz) clock speed as this is so easily achieved, and is essential if programs such as GEM are to be utilised. I found the functional speed to be about middle of the range for 16-bit machines I have used (from BASIC) until much writing to the screen was involved. Listing 2500 numbers took a pedestrian three minutes because of the slowness of writing screen graphics under GEM.

Formatting a new disk takes about one minute. However, backup to an already formatted disk is very efficient at 54 seconds. The Amstrad reads all of the source disk data and then dumps it to the target disk in one go (when using two drives).

If you mess around, as reviewers are expected to do (!), you'll find that the systems are not fail-safe. I unwittingly managed to corrupt the dynamic RAM which is continually refreshed by the battery backup and could only get the system operating again by removing the batteries to start everything from scratch.

All the usual operating systems are supplied to run IBM-type software. In addition, BASIC and GEM with Desktop and GEM Paint are provided.

Other software issued under the Amstrad label will be available at favourable prices. Examples are Supercalc 3, Wordstar 1512 (Amstrad), Reflex Data Base, and Sidekick – all at around $200 each.

Summary

The Amstrad PC1512 is a good, workmanlike, middle-of-the-road computer. On a value for money basis it must be considered as a viable option to the IBM PC and other machines of similar type in this class.

Probably the most preferred option will be the two disk, monochrome model. This is expected to retail at around $3000, exclusive of GST. For a colour screen, add about $650.

(Review machine supplied by Grandstand Computers Ltd, Auckland.)

Microcomputer Summary

Name	Amstrad PC1512
Manufacturer	Amstrad (UK). Made in Korea.
Microprocessor	8086
Clock speed	8 MHz
RAM	512 Kb (includes clock and configuration RAM)
Input/output	RS232C, Centronics, connectors for 8087 processor, mouse, joystick, light pen.
Keyboard	As for IBM PC, with numeric and capitals indicators
Display	Standard monitor, monochrome or colour. Tilt and swivel.
Graphics	640 x 200 maximum
Sound	Loudspeaker with volume control
Disk	360 Kb double sided standard 5¼-inch
Options	10 or 20 Mb hard disks internally fitted
Operating Systems	All usual 16-bit types
Languages	All usual range
Bundled Software	MS DOS 3.2, GEM, CP/M-86, DOS Plus, Basic, Desktop, GEM Paint
Supplied Extensions	Graphics, colour, mouse
Cost	Single disk mono from $2400, to 20 Mb hard disk colour version at $4800 (all exclusive of GST)
Ratings	(1 low, 5 high) Documentation 2, Support 4, Language 5, Expansion 4, Value 5.

Methods of valuing ordinary shares (Part 1)

By Martin J. Webb

Investment Analyst, Paul Morgan & Co Limited, Stockbrokers

Cecil Graham: "What is a cynic?"
Lord Darlington: "A man who knows the price of everything and the value of nothing."
Lady Windermere's Fan – Oscar Wilde 1891

Introduction

A common question often asked of stockbrokers is, "What is the price of shares in the XYZ Company Limited?" (if the company is listed on the Stock Exchange), or "What do you think I can sell my company for?" (if a businessman is looking to go public). Having received an answer to these questions, the person will then ask the adviser whether or not he or she should acquire or divest the shares or business in question.

In asking the second question, the client is now seeking a valuation opinion as to the attractiveness or otherwise of an investment. The investment analyst's job is to evaluate the attractiveness, suitability and feasibility of a large population of potential investment opportunities and assign a given valuation to each individual investment opportunity after making various assumptions and considerations.

To assist him with his task, the analyst will normally employ one or more valuation techniques or models which have evolved over the last 100 years or so. We will briefly consider a selection of these techniques, models and methods which are commonly used by stockbrokers, investment analysts, accountants and bankers, as well as the courts, in an effort to determine what a share is "worth".

Given the nature of these methods, we will confine ourselves to an examination of "fundamental" methods of share valuation.

At a later time it may be appropriate to examine how the technician would assess the "price" of a share, but for the moment we will concentrate on fundamental analysis techniques and defer discussion regarding technical analysis. In this column we will discuss only the four basic methods of valuation.

The basic method

Implicit in every valuation of shares is an attempt to balance the potential returns available from an investment with the perceived risks associated with that investment. The risks associated with a share will be as a result of both internal corporate factors and external economic and market factors.

These factors are recognised, to differing degrees, in most valuation models. The creditability of each model and its resulting valuation will ultimately depend upon the variables fed into the model. Thus "rubbish in, rubbish out" and vice versa. The key ingredient is the ability of the practitioner to consistently supply superior estimates of key variables, although this is essentially a subjective exercise.

The following are methods most commonly used in the valuation of unlisted public and private companies:

(i) **Capitalisation of profits:** the formula for valuation is:–

$$\frac{\text{Estimated annual tax paid Future maintainable earnings X } 100}{\text{REquired rate of return}} = \text{Value of Entity}$$

The concept underlying the method is the value of the business is related to the profit it earns considered in the light of the risks involved. The critical components of this valuation are the estimate of "future maintainable profits" and the required rate of return. Obviously different types of business and different investors will produce and demand different returns peculiar to their unique situations.

(ii) **Capitalisation of dividend yield method:**– the formula for valuation is:

$$\frac{\text{Estimated annual future dividend X } 100}{\text{Required rate of return}} = \text{Value of Shares}$$

As can be seen, this method is very similar to method (i) above except that it capitalises future dividend, not profit streams. This method is considered appropriate in the valuation of small parcels of shares, whereas method (i) is considered appropriate in the valuation of controlling interests in a business.

(iii) **Net assets – going concern value:** this method is generally used in conjunction with the capitalisation of profits method to test the reasonableness of the goodwill element included in the capitalisation of profits valuation.

Example –
Valuation as per method (i) say $100,000
Value of Net Tangible Assets after taking into account market value of assests say $80,000
Goodwill component $20,000

The reasonableness of the goodwill valuation is then tested by one or more of the various methods commonly used. The most popular of these is the "super profits method" which directly relates the goodwill valuation to the risk adjusted excess returns earned by the entity.

(iv) **Net assets – liquidation value method or "Break-up method":** the aim of this method is to estimate the amount which would be available for a purchaser of shares after the company has been wound up and after all necessary outgoings have been met.

Thus, realistically this method should be used only where the purchaser of the company is able to place the company in liquidation, or liquidation is likely.

Summary

The above methods are basic, easy to understand methods of valuing companies, given differing circumstances. Because of the increasing complexity of business and the increasing sophistication of world capital markets, various other more detailed models have been developed to value shares.

The Capital Asset Pricing Model, The Dividend Discount Model and its many variations, and the Arbitrage Pricing Theory Models, to name a few, are all now gaining acceptance and application among practitioners. Interestingly, nearly all of these models lend themselves to computer related programs and applications.

In subsequent columns we will examine these models in some detail.

Super recovery from disk wipeout

by Peter Biggs

Every so often someone produces a utility that really works and offers to do one specific job well. 'Fastback' is one recent example.

This one, MACE+ Utilities, has one end in mind – recovering from file deletion or an accidentally formatted disk. It includes a set of utilities that aids to that end and, although aimed more directly at users of hard disks, it can be used with floppy disks as well. It directly challenges the famous Norton Utilities, mostly used to recover accidentally delted files, and it makes a successful challenge!

It has on-line context-sensitive help screens which are excellent.

Mace+ is written by Paul Mace in Oregon (USA) and comes with one disk and a well written, informative, and at times quite technical, 60 pp manual. It has on-line context-sensitive help screens which are excellent. MACE+ is in colour with a selectable mono mode.

What exactly does it do? MACE+ does the following:

- Sets up and keeps a file on the root directory which can be updated via the AUTOEXEC.BAT file and is used to recover the disk if an accidental format occurs.
- Diagnoses problems such as 'bad spots' and shifts a file and updates the File Allocation Tables (FATs) to ensure no further data is written in these places. It is more comprehensive than CHKDSK.
- reclaims deleted files – even from unreadable disks.
- restores files and directories from an accidentally formatted disk.
- Optimises file recovery and file read performance by sorting files and directories and removing references to unused directories and files from the FAT.
- Condenses files into one complete physical piece on the disk – even on a completely full disk with 0K free! It can handle files up to 32Mb long.
- Claims to be excellent for Local Area Networks (LANs).

Paranoid

Well, with all this – does it work? The short answer is Yes. The only task that I did not attempt was to recover from a hard disk format. I'm sorry, but even I am paranoid enough as it is without deliberately putting my data in danger for the sake of a review. However, having used MACE+ to recover files, I can state that it is certainly the only utility I would reach for should this happy event occur. Instead, I used a floppy disk ("Coward," I hear you cry!)

Installing MACE+ was easy and an INSTALL batch file on the disk did it all for me. When MACE was installed, it created a file called BACKUP.M–U on the Root directory and placed a file RXBAK.EXE in there as well.

I put RXBAK.EXE into my AUTOEXEC.BAT file so that BACKUP.M–U is now updated every time I boot up. I also put it into a Menu batch file so that updating could occur throughout disk usage.

I then ran SQUEEZE, the directory/file sort, which then sorted 30 directories and 1010 files on 18Mb in about a minute. I then ran CONDENSE to reorganise my files into physically adjacent sectors and clusters. This took just over 1 hour 10 minutes! MACE+ shows a 'map' of the disk when it is checking the disk for damaged sectors and when it is condensing files.

After all this, file access was noticeably quicker and DIR gave (gasp of amazement) *alphabetically* sorted files to look at. I could have sorted by extension, time or date, but I chose name.

The prompts were clear and I could escape at any time by pressing ESC. It was easy to use.

I then set about recovering data from an 'accidentally' formatted floppy disk. It recovered it with ease.

Hard disks

How does all this work? Well, first a word about hard disks. A hard disk is a closed system. The disk itself is a platter coated with a thin film of iron oxide and it is spun on a cushion of air with the heads virtually touching the surface. This is why they are a closed system – because dust particles greater than 10 microns in size would cause a head crash. Most hard disks have four heads and two platters. They pack from 305 to 615 tracks in the same space the floppy puts 40 tracks, and 17 sectors where the floppy puts nine. It spins at 3600 rpm – twelve times as fast as a floppy disk.

The small electromagnetic heads

read and write information on the disk. Writing is achieved by turning a current pulse in the head on or off to magnetise a circular band (track) on the disk. Reading is done by searching the FAT for the sector required and then sensing a previously magnetised band.

A hard disk is purchased with a 'factory' format which lays down the tracks but does *not* divide the tracks into any particular sector or cluster length. A utility built into the ROM on the board (got at through DEBUG) enables you to choose an interleave factor and then a DOS utility called FDISK partitions the disk into a PC/MS-DOS portion and any other operating system (eg CP/M) portion. Most disks are fully PC/MS DOS.

The disks are then DOS formatted with the DOS command FORMAT/s. This checks the disk for bad sectors, clears the Root directory, sets up two 'blank' FAT tables and updates them with the 'bad sector' map and then installs the boot track and operating system files.

Note that data is not removed from the disk by FORMAT.

Note that data is not removed from the disk by FORMAT. Thus it is possible to recover from an accidental format provided that nothing is written to the disk afterwards. MACE+ will recover all the data possible.

One reason that files get crosslinked and 'lost' is that files are allocated the first available space and are usually spread over several sectors and clusters and are said to be 'fragmented'. The FAT keeps track of where the file is by keeping a 'chain' of addresses. Most files are fragmented on a hard disk where files are constantly being added and deleted and the file length being lengthened as in data files in a data base or text files.

Occasionally the FAT gets the wrong addresses and when CHKDSK is run, the message 'Files are Crosslinked' means that parts of two files apparently overlap. If the files are contiguous then file recovery is more reliable and the FAT is less likely to lose the addresses. The files on a floppy disk can be unfragmented by copying the files onto another disk with COPY *.*.

When a file is deleted, the first letter of the filename is converted to a 'sigma' (ASCII 229). Its entry in the FAT is still intact, including the start address on the disk and the length of the file, until the area is allocated to another file. That is why when a file is accidentally deleted, no further files should be written to the disk.

Recovering the file is mainly a matter of replacing the first character witha letter (usually I know the name of the file) and MACE+ will either automatically choose the clusters for the file from the FAT or it can be done manually. The FAT is then updated to fully restore the file.

Unlike Norton, File recovery gives you a chance to recover files onto another disk so that if you make a mistake, then another try is possible.

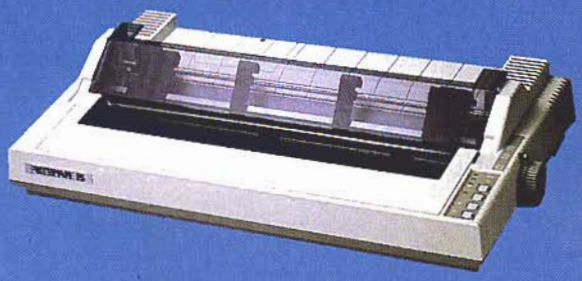
A word on Norton. I have used Norton V 2.x for some time and found it excellent. I upgraded to V 3.x and twice now I have found file recovery problems that have occurred because I only get one chance at recovery after a file deletion. I have now removed Norton and replaced it with MACE+.

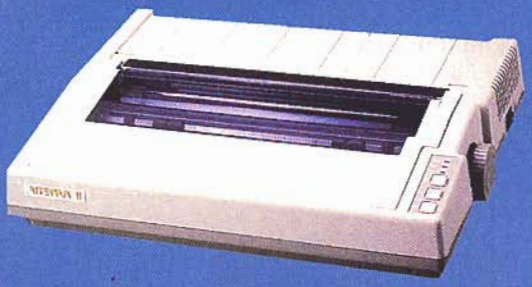
What more can I say? MACE+ works and it is well documented. It requires a minimum of 256K but works faster with 512K or more, DOS 2.0 or higher and two drives (one can be a hard drive). The manual is technical in parts for beginners, but using MACE+ isn't. I can thoroughly recommended MACE+ Utilities.

I would rate is 10 out of 10 on all counts except for the Manual, which rates a 7 for presentation but a 9 for content.

(The review copy was from Mail Order Systems (Mos), priced at $249 excl. GST.)

MORE FEATURES FROM NEW RITEMAN PRINTERS

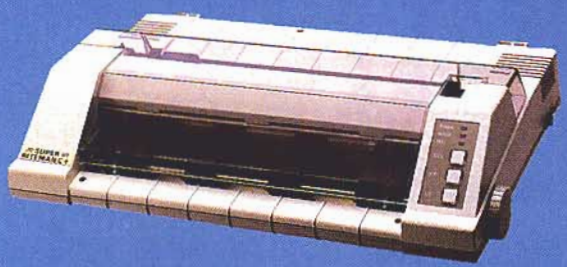


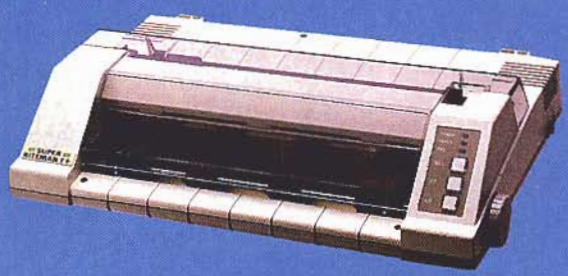


SUPER RITEMAN 15
15" 160 CPS

SUPER RITEMAN 11
10" 160 CPS

MAIN FEATURES: * Front Panel Switch Selection of: NLQ, Draft, Compressed, Expanded, Elite, Emphasised, Italics, Double Strike, Underline, Super Script, Subscript, Skip Perforation. * IBM Graphics Set * Atari 520ST Character Generator * Epson FX85 Emulation (Super Riteman II and Super F+ II) * Epson FX105/185 Emulation (Super Riteman 15) * 8K Ram * Parallel Interface Standard (Serial Optional) * Super F+ II has straight through paper path (ideal for label printing and printing on card) and built in stand. * Tractor and Friction Feed * 12 Month Warranty





Super C+
10" 120 CPS

* Draft and NLQ
* Commodore Interface built in
* Geos compatible
* Straight through paper path and built in stand
* Tractor and Friction Feed
* 12 Month Warranty

Super F+II
10" 120CPS

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- Supply of new operations manual
- Fitting of 8K Ram (except C+)
- Testing
- Return freight to user

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Warburton Franki

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WARBURTON FRANKI, Wellington (direct line) Ph (04) 693-016

A choice for newcomers

by Larry Elliott

First Choice from the PFS Group, Software Publishing Corporation is an integrated package combining word processing, spreadsheet analysis, file management and communications. As its name implies, it has been designed for people new to computers. The packaging makes several references like: "it really is easy...", ".. First Choice is specially designed for the person who wants to take advantage of the power of a computer without becoming a computer expert" and ".. no experience required".

With these claims in mind I set out to evaluate what looked like the newcomer's answer to all problems.

The program comes on a single diskette. A second diskette contains various sample files that are used in the tutorial and the dictionary files. More about these later.

The manual is spiral bound and is printed on good quality paper. The print is very clear and good use is made of screen examples to help with explanation of the text. Major sections are devoted to each part of the program. A "quick tour" section is a most informative and clear tutorial for all sections other than Communications.

Installation

First Choice is designed for the IBM PC and compatibles. It requires 256K of RAM and at least one 5.25" disk drive. (For those with the newer IBM machines 3.5" disk format are available free of charge, at least in the US and one would assume also here.) Monochrome and colour (IBM Colour Graphics Adapter) are supported and the program is able to be installed on a hard disk. Both the Microsoft Mouse and the PC Systems Mouse are supported as is a math co-processor. More than 50 printers including Laser Jet models are supported and, although not all that relevant for local users, the package supports over 30 modems.

Unfortunately, as in many other programs the instructions for installing the package for the usesr's specific hardware are hidden away at the back of the manual in an appendix. Although clear directions are given to read through and follow the instructions in this appendix before attempting to use the program, I still can't understand why installation instructions can't be in the front of a manual.

Installation called Set Up Equipment, is accessed from the main menu, making any modifications to the set up relatively easy. Instructions, both in the manual and within the set up section are very clear, and a novice to computing should have no difficulty in setting up.

The program as distributed will work with an IBM monochrome or colour monitor, an IBM dot matrix printer connected to LPT1, and a Hayes compatible modem connected to COM1 without running the installation program. Despite this, it is still recommended to run through the set up routine in order to obtain all of the features for your specific hardware setup. One option allows a mono monitor connected to a colour graphics card. This is particularly helpful for a clear display on many of the various portables supported.

Having completed the set up, the user is returned to the main manu.

On-line training

The basics of all sections within First Choice, with the exception of communications, are very well covered in the "Quick Tour" section of the manual. Sample files for a hot air ballooning company called Flights of Fancy are included on the dictionary diskette.

The new user is guided through the basics of preparing and editing a document using the word processor, including retrieval of existing files, preparing a budget for expanding the company, using the spreadsheet and compiling a data base of bookings and preparing a mail list for merging with a form letter using the file manager section.

The sample files have been carefully structured to ensure the user

gains an understanding of the basics of each of these sections. For most users this tutorial will provide all the training required to gain a working knowledge of First Choice.

On-line help is available at all times by pressing what is almost becoming the default IBM Help key, F1. Directions are concise and unambiguous.

Word processing

All applications with First Choice are RAM based, so the more RAM, the larger the file that can be worked with. A clear indication of the per cent full status is always given on the first line of the screen.

The Word Processor section has all of the normally accepted features. A menu bar sits across the top of the screen. It is important to note that the same menu selections are available for each section of the program. By pressing the appropriate function key, file saving, style, printing, special feature and editing commands are all accessed. Once the fundamentals of the package are absorbed the user will most likely want to use the speed keys to gain access to most of the regular functions. Again to aid the user these commands are the same for each application module.

The dictionary, spelling checker is English-based, rather than the more usual American-based ones typically distributed with word processing packages. Spell checking can be used with the spreadsheet and file manager in addition to the word processor.

Spell checking can be used with the spreadsheet and file manager in addition to the word processor

Blocks of text are moved using what First Choice calls "the clipboard". The section of text is highlighted and moved or copied to the "clipboard". This section of text can be recalled and copied or moved to a differing section of the document. A special feature of the clipboard concept is that data can be interchanged between the spreadsheet and word processor, or from a file manager report to a spreadsheet.

Files can be saved to disk in ASCII format or as a .DOC file. Unfortunately First Choice doesn't provide any file translation facilities for files to or from other word processors other than via ASCII format, although other packages from PFS can read files written by First Choice.

For long documents, a JOIN function allows for compiling various sections during printing.

One thing that users should be aware of is that a file can be printed only if it has been retrieved and is on the screen. There is no provision for printing one file while working on another.

Spreadsheet

Again this is totally RAM dependent for spreadsheet size. For a system with 256K a "page" of 255 rows and 70 columns is available, and with 640K, 1024 rows and 768 columns. As for the word processor the per cent full status is always clearly displayed.

The normal functions one associates with spreadsheets are available with First Choice. Most commonly used trigonometrical, statistical and financial formulae are available.

Some interesting features are automatic column width setting depending on the length of the column heading, currency formatting of cells in 16 different national currencies including pounds sterling and most European currencies, and a quick entry format for titles. If, for example, column 1 had the title January and the details were copied

across to adjacent columns, column 2 would be headed February, column 3 March and so on. Other formats usable are Week 1, Week 2..., QTR 1, QTR 2..., Monday, Tuesday... etc.

Sample spreadsheet templates are included for a general home budget and a business expense report and budget. These of course can be edited to the individual's requirements.

File management

This section, which allows building up of data forms which are stored in folders and then generating various reports from the stored information, would appear to satisfy the needs of most small business users for mailing lists etc. Conditional searches are a feature, and the data on a form can be used to generate various differing reports.

Sample forms are included, together with report formats to allow the user to create an address list and use this to generate both mailing lists and a telephone number list. If an auto dial modem is available this list can then be used as an automatic phone dialer. Other samples include a household inventory of assets, cheque book reconciliation, customer invoice and order folder, and an active account ledger system.

Communications

This section is relatively easy to use. It has the capability of storing logon information to avoid typing in data each time one dials up a remote system. Files created by the other sections can be sent to the remote system either as an ASCII transfer or using the Xmodem protocol, and can also be received using XModem protocol.

As with the other sections, all information is kept in RAM and must be saved either to disc or printed for future reference.

I had little difficulty in using the Communications section to call up Delphi via Pacnet and retrieve my mail. This communication system will not support 1200/75 systems and therefore is not suited for the NZPO Videotext system although it is perfectly suited to bulletin boards and the NZPO's Starnet.

Summary

I found this package surprisingly versatile. Within a very short time after completing the on-line training I was very comfortable with using it. Having had the opportunity to try it out I have to agree with the claims made on the packaging about the ease of learning to use it.

With the exception of the communications section, a workable knowledge can be gained within about an hour.

I have only minor reservations. One is the requirement to have a file on the screen in order to print it, and another is the lack of capability of file transfer to and from other packages.

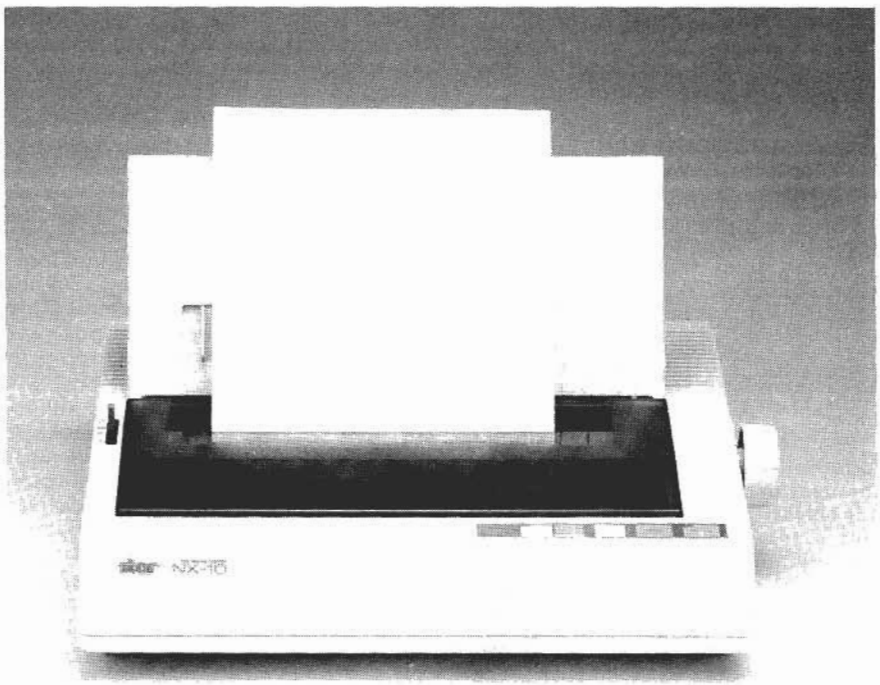
One thing that is not available within First Choice is graphics. This is becoming a very heavily promoted aspect of reports and spreadsheets, but the user of First Choice need not despair. An excellent product from New England Software Inc. called Graph-In-The-Box will very adequately fill this gap. This is a memory resident package that allows graphing of data, not from a file but directly from the screen. A very limited look into the capabilities of Graph-In-The-Box has convinced me that it makes an ideal complimentary program to First Choice.

First Choice: $620.00 incl. GST.
Graph-in-the-Box: $130 approx.

(Review copy supplied by Imagineering Micro Distributors Ltd, Auckland, New Zealand distributors for Software Publishing Corporation.)

Update from Star

by Shane Doyle



The new Star NX-10 printer is a considerable redesign from its predecessors, the Star SG10 and Gemini 10X models. Having used both the latter two machines continuously over the last three years, I was eager to see what changes had taken place.

The outer shell is of more refined and streamlined design, still retaining the mandatory oyster white colour. Most noticeable differences are the mode panel relocation and the lower profile of the unit, while the removable pull tractor feed unit has changed to a rear-mounted non-removable push feed unit, now flush with the top surface. A ribbed plastic panel covers the rear third of the top deck, and fanfold paper is fed underneath. However, this panel can be raised to about a 70-degree angle on a fold-out support, to enable single sheets to be easily loaded.

The paper release lever on the left now has four positions: free wheel, sprocket feed, friction feed, and an auto-load position for single sheet. The latter facility is a gem when using single sheets – pop in a sheet of paper and push the paper release lever to the auto-load position, and the sheet is fed to the correct start location and the head homed ready to print. This feature is also used for the NX10's main optional accessory, one that makes it stand out in the 10-inch class – the automatic cut sheet feeder.

Even today you can still count on the fingers of one hand the number of 15-inch matrix printers under $2000 that offer an automatic sheet feeder, let alone 10-inch units. This one is a little beauty and operates flawlessly. It takes about two seconds to mount and depresses a leaf switch that tells the printer it is fitted; no cables to forget to plug in!

Ribbon cassette

When I first had a look at the printer I was dismayed to find that the good old cheap and grubby Underwood spool ribbon had finally been replaced by the clean easily loaded expensive ribbon cassette. However, Star has not forgotten the impoverished home computer nut, and the cassette can be easily opened and a much cheaper ribbon refill dropped in. This procedure can be done five times, when it is recommended that a new cassette is purchased.

The configuration DIP switches have also moved from the left side to a recessed panel beneath the ribbon cassette, covered with a dust flap. It is necessary to remove the ribbon cassete for access to them – not quite as convenient as on the SG10.

Now to the new front mode switching panel. At first glance it appears to offer only three functions: linefeed; online; and control over the print mode – bold, 10cpi, 12cpi, 16cpi, and NLQ. Each print mode has its own LED indicator, and a document that has lots of mixed print modes creates quite a little light show as the indicators blink on and off.

Delving into the manual reveals nine other useful functions accessed by pressing various combinations. Some of these are very useful and often used – left and right margin set, forward and reverse fine adjustment, italics, and hex dump. Form feed is achieved by pressing the online and line feed switches together. In margin adjust modes, the head steps a column at a time until the switches are released.

I am disappointed in one component that has not changed, as the NX10 still retains the cogged rubber belt controlling head positioning. I feel this should be changed to a wire cable as on some other printers. The rubber belt does not lend itself to consistently accurate positioning when printing vertical bars in bidirectional printing mode. This can easily be tested by printing a number of lines of vertical bars (CHR$(179)). In bidirectional mode the bar printed as the head returns is always slightly out of alignment with the bar printed on the forward pass. To correct this problem it is necessary to switch to unidirectional mode which doubles the printing time.

Another added feature is the capability to print BIG characters – double height double width, and quadruple height quadruple width. For some reason there is also the option to print only the upper half or lower half of the characters in either mode. I'm still racking my brains to find a use for that feature.

High-resolution bit-map graphics images are reproduced superbly – the Star machines have always been good at this. As with most fully featured printers these days, it offers normal density (60 dots per inch), double density (120 dpi), and quadruple density (240 dpi). A further option gives double density at double speed.

The complexity of printer control code sets grows with every new model these days, partly due to the increasing capacity of the ROM chips that contain the controlling software, and the NX-10 is certainly no exception, with no fewer than 103 control code sequences covering 70 different functions. Some of these control new features such as the cut sheet feeder, the enlarged character modes, and reverse line/page feeding, the latter sorely missed on the old SG10.

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At the same time you will go in the draw to win one of six disk storage bins and 30 double sided double density disks from Verbatim, valued at more than $250!

Each completed return will become part of the draw and all information entered on the form will remain confidential to Bits & Bytes Ltd.

Thank you for taking the time to assist us and good luck in the draw.

Gaie Ellis, Managing Editor.

First, one or two personal details. Please tick the boxes where appropriate.

Name: .....

Phone: ..... Sex: .....M.....F..... Age .....

Address: .....

.....

.....

Do you personally own a computer? ..... Yes..... No.....

Is there a computer in your home? ..... Yes..... No.....

Do you intend making a computer purchase during the next 12 months? ..... Yes..... No.....

Do you intend making a peripheral purchase during the next 12 months? ..... Yes..... No.....

Do you intend purchasing software during the next 12 months? ..... Yes..... No.....

If you personally own a computer, what kind is it?

.....

If you use one in your business, what kind is it?

.....

Do you make computer related purchases or purchase decisions in your work? .....

What do you use a computer for? .....

.....

Which of the following best describes you?

Student
Wage earner.....
Manager.....
Managing Director.....
EDP Manager.....
Analyst.....
Tertiary student
Salaries worker.....
Executive.....
Company Director.....
Programmer.....
Other ..... (please state)

If, in your work you are involved in computer, peripheral or software purchases or purchasing decisions, what would you estimate the total value of purchases to be during the next 12 months:

Up to $2,000... Between $2,000 and $10,000
Between $10,000 and $50,000
Between $50,000 and $100,000
Over $100,000

The following is a list of the type of information currently covered regularly in Bits & Bytes. Please give each your interest rating:

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New product information	☐	☐	☐
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Games Reviews	☐	☐	☐
Application stories	☐	☐	☐
Programs	☐	☐	☐
Rural news	☐	☐	☐
Business news	☐	☐	☐
Finance	☐	☐	☐
Computer Industry news	☐	☐	☐
MSDOS column	☐	☐	☐
Micros at Work	☐	☐	☐
Education	☐	☐	☐
Machine Language	☐	☐	☐
Pascal	☐	☐	☐
BBC Col	☐	☐	☐
Apple Column	☐	☐	☐
Programming tips	☐	☐	☐
Toolbox	☐	☐	☐
Questions & Answers	☐	☐	☐
Multi-user columns	☐	☐	☐
Commodore	☐	☐	☐
Amstrad	☐	☐	☐
IBM	☐	☐	☐
Communications	☐	☐	☐
Sanyo	☐	☐	☐
Atari	☐	☐	☐
Sega	☐	☐	☐
Sectravideo	☐	☐	☐
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Win a Verbatim Bulk Disk Pack containing 30 Datalife DS/DD Mini Disks Total Value $242.30 including G.S.T. Return TODAY to Freepost 1864 Auckland

Flexibility

All these functions make the NX-10 an extremely flexible unit, capable of doing almost anything one would ever require from a printer. The only feature the NX-10 does not have is a colour printing option, and I have no doubt we will see that offered in some future release of the printer.

The quality and usefulness of the owner's manual went from average to superb when the SG10 was released, and the NX-10 manual maintains that standard. All features are fully covered, grouped into chapters covering similar functions. A set of functions is tabulated along with the control codes. Each function is explained, a sample program is given to perform the function, and in most cases it is followed by an example of the subsequent output. The style is conversationally friendly and pitched at the non-technically minded user. The only addition I would suggest is a brief command summary using the decimal codes, as well as the summary using the ASCII equivalents. For some reason I find it easier to remember the decimal codes rather than the actual characters.

The base NX-10 model is supplied with a standard Centronics parallel interface and is fully IBM compatible. For those users needing a serial printer, a variant is the NL-10. This unit has no integral interface, either a serial or parallel plug-in interface cartridge being supplied as required. Commodore users can choose a version with ROMs customised for their machines, and a further version tailored for Apple computers is due soon.

Delving into the manual reveals nine other useful functions accessed by pressing various combinations

While the NX-10 is not in the budget printer class, the printer alone is not overly expensive either. Bought as a package with the cut sheet feeder, the value for money rating climbs steeply. For $1180 one gets a computer output peripheral that has little or no competition in terms of features offered for the dollars paid. It is ideally suited for the small business that only needs to use 10-inch wide paper, and a must for the home computerist who enjoys experimenting with the possibilities offered by today's generation of printers.

If you are serious about getting yourself or your business a new printer, my recommendation is to check the NX-10 out now.

Summary

Name	Star NX-10	
Manufacturer	Star Micronics	
Print method	impact dot matrix	
Print speed	120 cps in draft mode	
	30 cps in NLQ mode	
Print width	80 columns draft mode	
	136 columns compressed mode	
Print buffer	5k bytes	
Character sets	96 standard ASCII characters	
	33 international characters (11 sets)	
	81 IBM special characters	
	52 IBM graphics characters	
Character matrix	18 x 11 dots, NLQ mode	
	12 x 11 dots, IBM graphics mode	
	9 x 11 dots, draft mode	
Graphics matrix	8 x 480 dots, normal density	
	8 x 860 dots, double density	
	8 x 1920 dots, quad density	
	8 x 640 dots, CRT graphics mode	
Paper feed	friction and tractor	
Paper handling	10" fanfold or cut sheets	
Interface	Centronics parallel	
Special features	near letter quality	
	short tear-off	
	front panel mode switching	
	hex dump	
	automatic single sheet load	
	automatic single bin cut sheet feeder	
Pricing	NX-10 printer	$920
	cut sheet feeder	$260
	ribbon cassette	$ 25
	ribbon refill	$ 14
	NL-10 printer	$860
	NL-10 parallel interface	$160
	NL-10 serial interface	$290
	(all prices excluding GST)	

Review hardware courtesy of Genisis Systems Ltd

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HARDWARE SURVEY

Microcomputers under $5,000

Welcome to another Bits & Bytes *roundup of the latest available personal computers in New Zealand. This month we look at machines retailing for less than $5,000, while more expensive PCs will be covered in the February and March 1987 issues.*

The days of gimmickry being the major selling-point of microcomputers would appear to be over, with potential buyers being very much aware of quality and performance within a given price range. The touch screen and mouse, which everybody thought two years ago would take over from the keyboard, are still there, but so are the keyboards, and serious users are opting for the particular operating environment they find most suitable.

Prices quoted should be taken as a guide only. Fluctuating exchange rates, particularly with the strengthening yen, can change the price of computers overnight, and while some distributors quote prices including GST, others prefer to give the base rate. In other words, check all prices before you buy.

Not all distributors managed to get their survey information in to us before the deadline date, so if there's a gap where you thought you should find a computer, it may well be filled in a future part. Of course, the gap could also be explained by a particular machine's being outside the range of this, Part 1 of the roundup, so again it should appear later.

COMMODORE 64C

Processor:	MOS 8510
RAM:	64Kb (38Kb basic available) (50Kb machine code)
ROM:	20Kb
Keyboard:	full size typewriter qwerty 62 keys, 4 function keys
Video:	Composite monitor or television as required
Resolution:	320 x 200 pixels
Interfaces:	User port with RS 232C facilities, cassette, serial, cartridge and 2 joystick or light pen ports
Disk drives:	1541 (not included) compatible with 1570 and 1571
Operating system:	Commodore BASIC 2.0
Languages:	Logo, Pascal and others not included
Optional:	Joystick, disk drives, printers etc
Price:	$595.00

COMMODORE 128

Processor:	8502, Z80A
RAM:	128Kb
ROM:	48Kb
Keyboard:	full size typewriter qwerty 92 keys, 4 programmable function keys, numeric keypad
Video:	40 column (composite) and 80 column (RGB)
Resolution:	320 x 200 pixels (40 column). 640 x 200 pixel (80 column)
Interfaces:	User port with RS 232C facilities, cassette, serial, cartridge and 2 joystick or light pen ports
Disk drives:	1571 (not included) compatible with 1570 and 1541
Operating system:	Commodore BASIC 7.0 and 2.0. CP/M plus V3.0
Languages:	Logo, Pascal and others not included
Optional:	Joystick, disk drives, printers etc
Bundled software:	Demo disk and CP/M plus V.3 disk including CP/M utilities
Price:	$995.00

AMSTRAD CPC6128

Processor:	Z80A, 4MHz
RAM:	128Kb in two 64Kb banks
ROM:	48Kb
Keyboard:	74 keys Qwerty, numeric cluster
Video:	three screen modes up to 16 colours
Resolution:	mode 1, 320 x 200 mode 2, 640 x 200 mode 0, 160 x 200
Other components:	speaker, colour or green screen monitor
Operating system:	CP/M 2.2 and CP/M Plus, utilities, DR LOGO.
Prices:	$1495 green screen, $1895 colour, incl GST

HARDWARE ROUNDUP under $5,000

COMMODORE 128D

Processor:	8502, Z80A
RAM:	128Kb
ROM:	48Kb
Keyboard:	full size typewriter qwerty, 92 keys, 4 programmable function keys, numeric keypad
Video:	40 column (composite) and 80 column (RGB)
Resolution:	320 x 200 pixels (40 column), 640 x 200 pixels (80 column)
Interfaces:	User port with RS 232C facilities, cassette, serial, cartridge, and 2 x joystick or light pen ports
Operating system:	Commodore BASIC 7.0 and 2.0. CP/M plus V 3.0
Languages:	Logo, Pascal and others – not included
Optional:	Joystick, disk drives, printers etc
Bundled software:	Demo disk and CP/M plus V3 disk including CP/M utilities
Price:	$1,795

MAGNUM

Processor:	8088/2 4.77/8 MHz switchable
RAM:	640Kb
ROM:	8Kb expandable to 40Kb
Video RAM:	64Kb
Keyboard:	AT enhanced type
Video:	80 x 25
Resolution:	720 x 348
Interfaces:	Centronics parallel
Disk drives:	single or dual 360Kb 10-40Mb Winchester
Operating system:	MS-DOS
Languages:	all
Bundled software:	MS-DOS 2.11
Price:	PC-1 $1848: PC-2 $2189: XT-10 $3454: XT-20 $3795: XT-30 $4290, Inc GST Monitor extra.
Expansions:	8 expansion slots.

TANDY 1000 EX

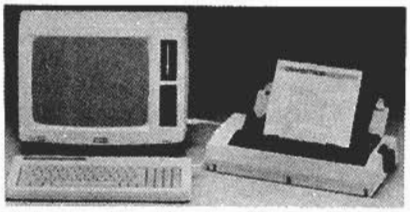
Processor:	8088 clock speed 7.16/4.77 MHz
RAM:	256Kb standard, to 640Kb
Keyboard:	Integral 90 key, including numeric keypad, 12 function keys separate cursor keys
Video:	Composite output... mono or colour RGBI monitor
Resolution:	640 x 400 pixels
Disk drives:	1 internal 360Kb, optional external drives
Operating system:	MS DOS 2.11
Languages:	GW BASIC
Bundled software:	Personal DeskMate
Prices:	$2,375 mono monitor $295, high res colour $995,
Expansions:	640Kb RAM, external 720Kb disk drive

HARDWARE ROUNDUP under $5,000

AMSTRAD PC1512

Processor:	8 MHz 8086
RAM:	512Kb
ROM:	BIOS
Keyboard:	full size Qwerty, adjustable legs.
Video:	IBM colour graphics
Resolution:	alpha, 16 colours, 40 x 25, 16 colours, 80 x 25; graphics; 320 x 200, 640 x 200
Disk drives:	1 or 2 360Kb 5¼" or 1 floppy with a 10 or 20Mb hard disk
Other components:	2-button mouse, battery backed real time clock and configuration RAM, speaker
Operating system:	MS DOS 3.2
Optional:	all MS-DOS languages
Bundled software:	GEM Desktop, GEM Paint, Locomotive BASIC
Prices:	from single drive monochrome $2395 plus GST to 20Mb hard disc with colour screen $4735
Expansions:	expandable to 640 Kb on motherboard. 3 full size IBM expansion card slots, network compatible

AMSTRAD PCW8256



Processor:	Z80A 4MHz
RAM:	256Kb
Keyboard:	separate 82-key
Video:	high-res green screen 90 columns. 32 lines
Resolution:	RS232 serial & Centronics parallel
Disk drives:	360Kb 3-inch second 1Mb drive optional
Other components:	integral NLQ printer
Operating system:	CP/M Plus with GSX graphics enhancement
Optional:	PASCAL, COBOL, C, FORTRAN, MICROPROLOG, FORTH
Bundled software:	Locoscript word processing, CP/M Plus, DR LOGO, Mallard BASIC
Prices:	$2395 including GST
Expansions:	second 1Mb disk drive

BONDWELL 30 SERIES

Processor:	8088 4.77 MHz
RAM:	640Kb
ROM:	8Kb
Video RAM:	4Kb
Keyboard:	standard IBM compatible
Video:	80 x 25
Resolution:	standard IBM 720 x 348
Interfaces:	Centronics on mono graphics card
Disk drives:	single or dual 360 Kb 10, 20, or 30Mb Winchester
Operating system:	MS-DOS 2.1 (included)
Languages:	all as under MS-DOS
Bundled software:	MS-DOS 2.1 GW-BASIC
Prices:	BW-32 $2497; BW-34 $2992; BW-36/10 $4994; BW-36/20 $5489; BW-36/40 $7997 (Monitor extra) Inc GST
Expansions:	5 free slots

DATAMINI PC

Processor:	8088
RAM:	640Kb
ROM:	Phoenix BIOS
Keyboard:	AT look-alike 84-key
Video:	12 inch green anti-glare monitor
Interface:	parallel printer standard, mono or colour graphics
Disk drives:	2 x 360Kb TEAC
Operating system:	MS DOS 3.2
Prices:	$2590
Expansions:	a full range of boards available

BITCOM PC

Processor:	8088-2 switchable 4.77-10 MHz
RAM:	640Kb expandable to 3Mb
ROM:	Phoenix Bios
Keyboard:	AT style, 84 key, separate, 10 function keys, numeric pad, height adjustable, L.E.D. displays
Video:	choice of full range of Thomson Monitors.
Resolution:	colour to 690 x 240
Interfaces:	Parallel port standard, RS232 optional
Disk drives:	2 x 360Kb floppy standard, hard disks optional
Operating system:	MS DOS 3.2 standard, PC DOS 3.2 optional
Languages:	GW-BASIC standard level II cobol optional
Optional:	streaming tape, EGA card, mouse, joystick, light pen, digitizer, bar code reader, EPROM programmer
Bundled software:	MS DOS 3.2, GW-BASIC
Price:	from $2610 plus GST
Expansions:	additional RAM, hard disks

POLYCORP POLY 2

Processor:	6809
RAM:	128Kb
ROM:	22Kb
Video RAM:	16Kb
Keyboard:	full qwerty, 94 keys 32 programmable functions
Video:	350mm full colour
Resolution:	4.1mm pitch
Interfaces:	3 x RS232C, 1 x Centronics, 1 x HDLC network
Disk drives:	two 8 inch, 600Kb each
Operating system:	Polysystem, CP/M
Languages:	POLYBASIC, PASCAL
Bundled software:	BASIC interpreter/ compiler, utilities
Price:	$2,950.00

HARDWARE ROUNDUP under $5,000

ERGO PC-88 SERIES

Processor:	8088 4.77MHz
RAM:	256Kb exp to 704Kb
ROM:	8Kb exp to 40Kb
Keyboard:	99-key fully definable, 10 function keys
Video:	monochrome 720 x 350 colour 320 x 200
Interfaces:	1 serial (RS-232C), 1 parallel standard
Disk drives:	360Kb, 10Mb or 20 Mb hard disk (optional)
Operating system:	MS DOS 3.11 or 2.11
Languages:	BASIC
Optional:	other operating systems CP/M-86 etc
Prices:	from $3097

SANYO MBC895/890

Processor:	8088-2 switchable 8.00/4.77 MHz
RAM:	256Kb standard
ROM:	16Kb (B105/LG)
Keyboard:	84 keys, sculpture type
Interfaces:	Centronics parallel
Disk drives:	one (MBC890) or two (MBC895) FDD 5¼" 360K drives
Operating system:	MS-DOS 2.11
Languages:	GW-BASIC version 2.02
Bundled software:	Wordstar 2000
Prices:	MBC890 $3278 GST Incl. MBC895 $3706 GST Incl.
Expansions:	384Kb on main board. 10 or 20Mb upgrade

PANASONIC BUSINESS PARTNER CFX600

Processor:	8086-2 4.77 or 7.16 MHz
RAM:	640Kb
ROM:	32Kb
Keyboard:	separate 95 keys inc 20 function keys, separate numeric pad, cursor pad, LBMAT compatible
Video:	13" colour or 12" monochrome, 80 characters by 25 rows
Resolution:	640 x 400 pixels
Interfaces:	parallel as standard
Disk drives:	2 x 360Kb
Operating system:	MS DOS
Languages:	MS DOS compatible eg BASIC, COBOL, FORTRAN etc
Bundled software:	MD DOS and BASIC
Price:	$3300 ex GST
Expansions:	20 Mb hard disk, 4 long slots and 2 short slots.

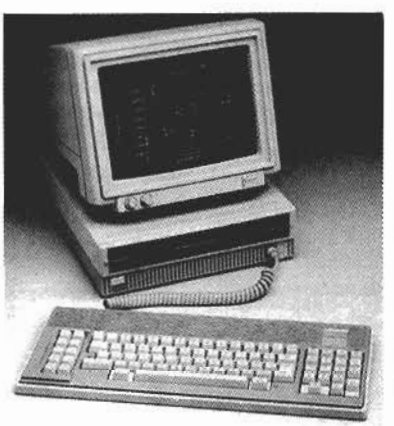
COMMODORE PC 10

Processor:	8088 16-bit (4.77 MHz)
RAM:	640 Kb
ROM:	16Kb standard
Keyboard:	detachable 85 keys including 10 function keys and numeric keypad
Video:	AGA card
Resolution:	320 x 200 and 640 x 200 (PC mono-chrome)
Interfaces:	Parallel printer, RS 323C, RGBI/mono-chrome ports
Disk drives:	dual 5.25" drives, double sided, 360 Kb, high speed DMA interface
Operating system:	MS-DOS
Languages:	GW BASIC, Intel 8087 Floating point processor, 720 K drives
Bundled software:	MS DOS 2.11, GW BASIC
Price:	$3,495.00
Expansions:	5 I/O expansion slots for PC compatible boards

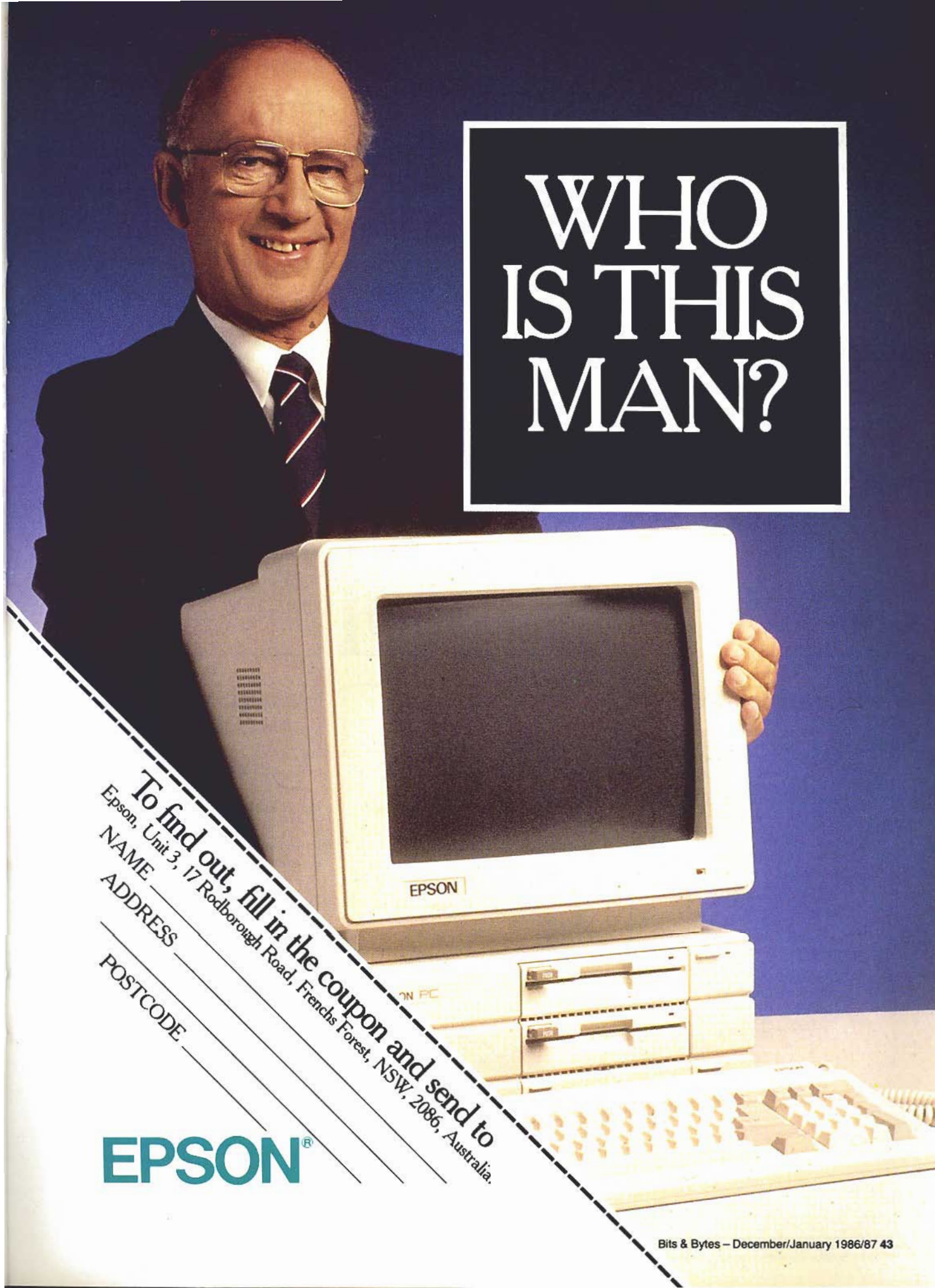
POLYCORP PROTEUS

Processor:	Z80A, 6809
RAM:	64Kb
ROM:	4Kb
Keyboard/Video:	any business terminal
Interfaces:	3 x RS232, 1 x Centronics, 1 x HDLC network
Disk drives:	2 x 600Kb floppy 8-inch
Operating system:	Polysystem, CP/M, Flex
Languages:	POLYBASIC, PASCAL
Optional:	Microsoft 80 BASIC
Bundled software:	CP/M utilities
Prices:	$3,500
Expansions:	hard disk, 20Mb $3,600

OLIVETTI M19



Processor:	8088, at 4.77 MHz
RAM:	640Kb
ROM:	16Kb
Keyboard:	industry standard
Video:	green or colour
Resolution:	640 x 400
Interfaces:	serial, parallel
Disk drives:	single or dual 360 Kb FDD, 20 Mb MDU
Operating system:	MS DOS
Languages:	all PC industry standard languages
Price:	$3590 for single 360Kb plus 255Kb RAM



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EPSON®

HARDWARE ROUNDUP under $5,000

PANASONIC SENIOR PARTNER RLH 7000

Processor:	8088
RAM:	256Kb
ROM:	16Kb
Keyboard:	separate, IBM PC layout, 83 keys, 10 function keys, separate numeric keypad
Video:	9" built-in, 188mm x 136mm display area, 80 characters by 25 rows
Resolution:	640 x 200 pixels
Interfaces:	serial and parallel & RGB output as standard
Disk drives:	2 x 360Kb floppies
Operating system:	MS DOS
Languages:	MS DOS compatible eg BASIC, COBOL, FORTRAN etc
Bundled software:	MS DOS and BASIC
Price:	$3600 ex GST
Expansions:	640Kb and 10Mb hard disk

ERGO MACRO-88 SERIES

Processor:	8088-2 (4.77/8 MHz)
RAM:	512Kb expandable to 1Mb
ROM:	8Kb expandable to 40Kb
Video RAM:	standard IBM mapping
Keyboard:	99-key fully definable 10 function keys, IBM character set
Video:	monochrome 720 x 350 text format 80 x 25 colour 320 x 200 text format 80 x 25
Interface:	2 serial (RS-232C), 1 parallel standard
Disk drives:	360Kb, 10Mb or 20 Mb hard disk optional
Other components:	built in battery backed RT calendar clock
Operating system:	MS DOS 2.11 or 3.11
Languages:	BASIC
Optional:	other operating systems available
Prices:	from $3722 with green screen (incl. GST)
Expansions:	8 expansion slots,

AZTECH TURBO 88 T88ED

Processor:	8088-2 CPU at 4.77-8 MHz
RAM:	640K
Keyboard:	84 keys
Interfaces:	two serial
Disk drives:	2 x 360Kb
Other components:	Parallel serial port, gameport, battery back-up, real time clock
Operating system:	MS-DOS 3.2
Languages:	Basic
Bundled software:	G W BASIC V3.2
Price:	$3,803
Expansion:	hard disks, LAN.

TANDY 1000 SX

Processor:	8088 clock speed 7.16/4.77 MHz
RAM:	384Kb standard, to 640Kb on motherboard
Keyboard:	separate, 90 keys,
Video:	Composite output, mono or colour RGBI monitor
Resolution:	640 x 200 pixels
Disk drives:	2 internal 360Kb floppies, optional 20Mb Winchester
Operating system:	MS DOS 3.2
Languages:	GWBASIC
Expansions:	5 slots, 8087 math co-processor
Bundled software:	DeskMate II
Prices:	$3,815. Mono monitor $295, Colour monitor $995

IBM PCJX (55113EI)

Processor:	8088 4.77 MHz
RAM:	256Kb-512Kb
ROM:	128Kb
Video RAM:	6Kb-32Kb user definable
Keyboard:	79-key compact (with or without cord); 98-key full (with or without cord)
Video:	16 colour monitor
Resolution:	max 640 x 200
Interfaces:	joystick, ROM cartridge slots, printer & monitor
Disk drives:	2 x 3.5" diskette drives
Operating system:	PCDOS 2.1 (JX)
Languages:	Basic & most other common languages (compilers)
Optional:	10Mbhard disk; 5½" diskette
Price:	$3,880.00 (Exclusive of GST)

COMMODORE AMIGA

Processor:	MC 68000 (7.16 MHz
RAM:	512Kb
ROM:	Writeable control store 256K, ROM 64K
Keyboard:	Detachable full size 89 qwerty, numeric keypad, 10 function keys
Video:	RGB analog or digital and composite
Resolution:	320 x 200, 320 x 400, (interlaced mode), 640 x 200, 640 x 400 (interlaced mode)
Interfaces:	Disk drive, RS232, parallel, expansion, RAM expansion, 2 controller ports
Disk drives:	Single 3.5" double sided, 880Kb, DMA controlled
Operating system:	AmigaDos and Intuition
Languages:	Amiga Basic
Optional:	MS/DOS, Pascal, Assembler, Forth, Fortran, Lisp etc.
Bundled software:	Kickstart, Workbench, Amiga-BASIC, Amiga Tutorial, Kaleidoscope
Price:	$4,295

HARDWARE ROUNDUP under $5,000

DATAMINI XT TURBO

Processor:	8088 4.77/10MHz switchable
RAM:	640Kb
ROM:	Phoenix BIOS
Keyboard:	AT look-alike 84-key
Video:	12-inch green anti-glare monitor
Interfaces:	parallel printer standard, mono or colour graphics
Disk drives:	360Kb TEAC disk drive and 20Mb Seagate hard disk
Other components:	external turbo switch
Operating system:	MS DOS 3.2
Prices:	$4490
Expansions:	full range of boards available

SHARP PC7000 COMPACT

Processor:	8086-2 7.37 MHz
RAM:	384Kb to 768Kb
ROM:	16Kb
Keyboard:	84 key, IBM layout, 3 LED. cord-attached
Video:	back-lit LCD, 80 col x 25 line
Resolution:	640 x 200
Interfaces:	serial, parallel
Disk drives:	2 x 5¼", 360Kb IBM format
Other components:	graphics-capable
Operating system:	MS DOS 2.11
Languages:	all available
Bundled software:	MSDOS 2.11
Prices:	$4445, carrycase $265 Printer $1259
Expansions:	20Mb hard drive, CRT adaptor, carrycase

PANASONIC SILENT PARTNER JB3300

Processor:	8088
RAM:	512Kb
ROM:	16Kb
Keyboard:	separate IBM PC lay out. 84 keys, 10 function keys, separate numeric key pad.
Video:	10" plasma screen, 80 characters by 25 rows.
Resolution:	640 x 400 pixels
Interfaces:	serial & parallel as standard
Disk drives:	2 x 360Kb
Operating system:	MS DOS
Languages:	MS DOS compatible eg BASIC, COBOL, FORTRAN
Bundled software:	MD DOS and BASIC
Expansions:	2 full length IBM slots 10 or 20Mb hard disk

PANASONIC EXECUTIVE PARTNER MODEL FT70

Processor:	8086-2 dual speed 7.16/4.72 MHz
RAM:	256Kb
ROM:	32Kb
Keyboard:	builtin IBMPC lay-out 83 keys, incl 10 function keys and isolated numeric keypad
Video:	10" builtin 192mm x 144mm plasma screen, 80 characters by 25 rows
Resolution:	640 x 200 pixels
Interfaces:	serial and parallel as standard
Disk drives:	2 x 360Kb floppy
Operating system:	MS DOS
Languages:	MS DOS compatible eg BASIC, COBOL, FORTRAN etc
Bundled software:	MS DOS and BASIC
Price:	$4500 excl GST
Expansions:	640Kb RAM, 10 or 20 Mb internal, hard disk, expansion bus port for 3 full length IBM cards

IBM PC CONVERTIBLE

Processor:	80C88, 4.77 MHz
RAM:	256Kb-512Kb
ROM:	64Kb
Video RAM:	16Kb
Keyboard:	full size keys & spacing, 10 functions, numeric keypad
Video:	LCD
Resolution:	640 x 200
Interfaces:	CRT display, serial/ parallel, compatible printer, auto adapter available
Disk drives:	2 x 720Kb, 3.5 inch diskette
Operating system:	PCDOS 3.2
Optional:	mono display, colour display, convertible printer
Price:	$4,632.00 (Exclusive of GST)

IBM PCG

Processor:	8088 4.77 MHz
RAM:	256Kb-640Kb
ROM:	64Kb
Video RAM:	4Kb-mono, 16Kb-colour graphics
Keyboard:	full keyboard, 10 function keys & numeric pad.
Video:	mono, colour graphics, enhanced colour graphics
Resolution:	colour graphics-640 x200, ECG-640 x 350
Interfaces:	most industry standards
Disk drives:	1 or 2 5.25" diskette drives
Operating system:	PCDOS 2.1 or 3.1 or 3.2
Languages:	Basic - most other common languages (compilers)
Price:	from $4,796.00 (Excluding GST)

Educational Computing: The Slough of Despond?

By Pip Forer

Bunyan's pilgrim in *Pilgrim's Progress* had a fairly trying time in the Slough of Despond fighting off inertia and apathy. Were he to return today, some would say that working in educational computing in New Zealand might provide a similar experiencie. Things seem to have gone rather quiet on the educational computing front, and there are even signs of a slow death in some quarters.

Is this a fair reflection on computers in education in New Zealand, and if so, why? Is it that school use is just a nine-day wonder, or is some of it attributable to lack of educational management?

To look more closely at this question, one needs to look at the history of educational computing to date. Almost all of the advances in educational computing in New Zealand can be attributed to grass roots initiatives. The heady progress in the secondary sector from 1982 onwards was achieved by concerned teachers and parents, and in spite of central disinterest and massive injections of zero funding. Only when faced by the tremendous efforts of teachers and parents did central administrations respond, inadequately and belatedly, with teacher training rsources and support facilities.

By 1985 this user-fuelled torch for innovation was beginning to be passed on to the primary schools, as the benefits of early exposure to Logo and word-processing became appreciated. Activity within the secondary sector, however, appeared to have slowed.

Some of this apparent slowing may be due to the media attraction having gone out of computing: people were in fact doing more and more new things, it is just that they were less newsworthy. Accepting that in some cases this is true, there are also signs that the problem goes deeper. In fact it goes deep into the roots of managing educational resources, and reflects how difficult it is for most institutions to cope with new technologies.

One of the most disturbing pieces of evidence in support of this, and one which highlights the problems of neglect, is given in a recent Canterbury Computer Education Society newsletter. In this issue inspectorate member Neil Fleming catalogues a directory of early innovators in computer education, all now gone from schools.

One might ask just what led this valuable group of motivated professionals to move elsewhere. Various temptations and opportunities can be suggested in each case, for computer skills open many doors, but arguably all also shared a common and severe frustration. This frustration is not unrelated to lack of recognition for their skills within teaching, and lack of any real confidence that computer education in New Zealand is going anywhere. One might argue that a system, and society, which desperately needs their skills has made no significant provisions to encourage them to keep their skills in education.

To understand what this means for a teacher, consider the typical educational computing pioneer. Such people possessed sufficient motivation and vision to have defied the low-cost lethargy with regards to equipment provision and probably bought their own computers early on. They frequently worked long hours in their own time training themselves up, and probably many dollars buying computer magazines. They slowly gained acceptance, persuaded the school to fund raise for some machines and converted some of their colleagues to look at using them. Suddenly computers are in the school and they can bask in a flow of well-deserved acclaim.

This may sound like a success story, but in fact it is just the start of the problems. The pioneers now want to develop their skills further. However, training that could extend or consolidate their capabilities is unavailable, and what training exists is too limited, too infrequent and too short. The hardware is now to hand, but more and more of the innovators' time is taken up by keeping it going and holding the hand of the newer users. Such users' needs and support overheads continue to grow for some time until they can gain significant competence, often several years, given the typical history!

The innovator does not even have an optimistic future outlook to sustain him or her. No one is sure when, how or if the school's hardware will be replaced or how new technology is going to be officially integrated into the syllabus. In brief, the innovators are left with no clear future,no recognition and no returns. They end up doing as a chore for many the computer support and housekeeping that once had to be done only for themselves. The time available for new growth goes out the window. Naturally, at some point, the innovator stops innovating, and is tempted to go out the window too.

Of course, this is the darkest scenario. Some (richer or more farsighted) schools employ technical support to help carry the burden. Others have understanding principals who allocate relief time or promotion in recognition of service in this area. But the response is patchy, and in many cases even an understanding head has little leeway (the smaller the school and the younger its pupils the more true this is).

Rewards require resources, and in a shrinking system with an established staffing situation, such resources are not always free to reallocate. Even where they are free, vested interests or uninformed decision-makers can block or misdirect change (the school committee which insists on determining the school's computer brand because the chairman can get a special on ENIAC clones from Macau is a version of this). Furthermore, the glaring lack of positive policy initiatives provides no context for individual principals to work in.

These problems are not unique to the school system. They are paralleled at the teritary level. Programming skills are leached out because staff reductions mean pressure to freeze positions or offer minimal salaries whenever vacancies occur. Yet vacancies occur most frequently amongst those with programming skills who are mobile and can command jobs and higher salaries outside. On the teaching front, different universities adopt different policies on innovation in CAL, from virtually ignoring educational computing to appointing full-time software consultants and specifically including educational computing work as a criterion for promotion.

This combination of circumstances at all levels gives little encouragement for innovative computer educators to stay. It is a testament to the dedication of teachers that so many are still enduring. Even their patience, however, must be limited.

The problem has at least three causes, all of which reflect a need for national support and national policy. Firstly, there is a tremendous lack of in-depth, in-service training. This leaves the pressure firmly on the 'on-site' expert or two to handle the demand for growing computer use, especially in the provinces. This pressure will only drop as the computers get simple enough for anyone to use and/or all the teachers get smart enough to use computers as an everyday part of their teaching. The perfect conversational computer is still some way off yet, so what is needed is massive training support. One question is: who will give it?

A logical answer, since using computers in education is basically an educational training exercise, is that existing training institutions should. The early failure to provide it in this way reflects neglect by central administration, slow responses by some tertiary institutions (when did your local college of education or university first offer a course in aspects of educational computing?) and a tendency to get hung up on hardware.

This last aspect reflects in the old attitude that once the hardware is in schools, all problems are solved (Treasury probably favours that one, especially if parents buy the hardware). Under this scheme, by some form of osmosis, involving super-beings of infinite resource and patience, hardware presence will transmute itself into wise educational practice throughout the curriculum.

Training, while improving, remains inadequate. It has, however, been usefully augmented by resources in unexpected places, such as the polytechs' contribution to giving teachers programming skills and computer literacy. Another area where support ought to be useful is from the machine suppliers themselves, but because the educational scene and usage pattern differs so radically from business practice, it is unreasonable to expect too much from this source. However it is noticeable that schools themselves fail to appreciate the importance of this source of support.

How many schools count in the value of effective educational support (skills, expertise, software guidance, query responses) when buying machines? The wise ones do, but to others the lure of cheap hardware overcomes all caution. Logic suggests that a dealer relying on high volume and low margins has little scope to give such back-up. Excessively cheap hardweare in education may end up being counterproductive, placing hardware into schools but ensuring low levels of distributor support. What a school committee saves in cash, someone else may pay in time and trouble: it may be the innovator whose skills you meant to maximise.

The second problem is institutional. New technologies are usually misunderstood by administrators in any organisation. Such technologies frequently alter priorites, change established hierarchies, revise values of skills and impose support demands that compete with established (and sometimes now outmoded) practices. Administrators dislike all of the hassles such changes bring. This holds as true for research funding in a tertiary system as for finding time for in-service training at primary level. The only hope for change is change from the top; clear directions and the creation of incentives to encourage rather than hinder innovations.

The problem impinges on the final aspect. There is a terrible shortage of high-quality evaluation and innovation in educational computing in New Zealand. The Computers in Education Development Unit works valiantly to achieve results in this area, but has little chance of success given the constraints it works under. Embedded within the Department of Education it is still beset by the mentality of minimal cost at any price.

The attitude sought at first to keep computers from primary schools because of cost and without reference to any educational arguments. It continues to be at work in a department which itself suffers the same pressures from Treasury. Any unit working within such political and financial constraints is always likely to be constrained in proposing any radical initiatives.

Yet there is a real need for direction and innovative ideas at a national level. There are enormous numbers of new directions in educational technology to be evaluated and tapped. There are also fine opportunities to tap the resources of the computer industry. What is needed is an independent body able to speak out and tap industry goodwill and research expertise through select initiatives. Such a body could be the catalyst and facilitator for new developments, bringing together resources for new projects. It does not even need to be a large body.

There are quite a few models overseas for this, admittedly not all derived from the pursest of motives. Some developed to encourage the local computer industry get into educational markets. Others, such as those in Australia, had no such axe to grind. A common strand, though, is that such organisations have been established independent of existing education departments to ensure a less tied perspective. Perhaps one of the smallest, but by far one of the most influential, has been the Council for Educational Technology in London whose work on computing in education in the last decade has been widely appreciated.

A small directorate to stimulate innovations in educational technology has been proposed by a New Zealand Computer Education Society working group, which is actively promoting the concept with industry and government. The idea deserves close attention. We will try and give it just that in an upcoming issue.

Printer dumps

By Pip Forer

The Compact is now well and truly launched, apparently to general grunts of approval from many primary teachers. What is less widely known is that the largest guaranteed market to date is in Italy. Olivetti has its eyes firmly on the undeveloped end of the school computing market and its advance order for 80,000 Compacts actually allowed the model to go ahead at all. (Spain too, where micros are even rarer, must be an attractive proposition.) Interesting that this all should happen in the year that Italian per capita GNP first overtook that of Britain!

Printer dumps

One of life's great mysteries is why more computer manufacturers do not provide fully integrated printers with their systems. Graphics has become such an important part of any machine that the ability to drop a screen image to paper is a major requirement for many applications.

On the BBC model B the solution for many was a ROM such as the Printmaster, which allowed immediate screen dumps to a variety of printers, even allowing changes in scale and orientation, plus different shading that represented different colours. Many users, however, used the small machine-code dumps that magazines such as Acorn User carried back in 1984 or so. Typically these dumps fitted into a page of memory (under 256 bytes) and were popped into crevices of memory below &E00 when called. They detected the mode in use, were far faster than BASIC one-liners, and were cheap. To use them, one simply installed them on a disk and entered, say, *PRINT in a program to get a dump.

The Master series causes headaches for such printer dumps for various reasons, as the comments below show. These headaches do not make such dumps useless, but do pose new demands on them. Here, in brief, are some of the problems a new Master user of a Model B convert may encounter, and tips to get round them.

Firstly beware *where* you load your dump routine. (You can find this out by using *INFO for the dump's file name: check the second or third field.) Many dumps designed for the model B use the space of &BOO.This functions fine on a stand-alone Master, but not on an Econet machine since &B00 is now used for the network filing system. The solution to this appears simple if you have the original source code for the dump: recompile the printer dump to work at &A00 (which is still devoted to infrequently used functions). However, you must hope nothing else in the program uses this area too, as many programs written for the model B do (a better solution is suggested later).

Next you will find that your dump routine will only work with the normal modes 0-7. The reason for this is the same as the reason why you may have problems loading a screen image to shadow memory (see this column two months ago). Essentially the screen dump works by converting memory used for display into patterns to the printer which will produce the same picture on paper. A model B printer dump expects to find the screen memory somewhere just below address &8000, say starting at &3000 for Mode 1.

If you are using shadow mode, and have a large program in memory, the poor dump will just go ahead and dump the normal memory, which contains part of your program and data and so produces a bizarre though sometimes attractive pattern. This is because all but one of the locations in the BBC that give information on current mode treat the shadow modes the same as normal ones. For instance, a call to OSBYTE 135 gives the current mode number, and will contain a zero for both mode 128 and 0, a 7 for both modes 7 and 135. If you want your dump to automatically sense when a shadow mode is in use you need to go to location &FF34, where the bits define the current memory status (in particular bit 2 says whether shadow mode is in use or not) or else use OSBYTEs 250 and 251.

If you now know you are in shadow memory then the obvious solution to printing is to page in the screen memory as normal memory and then dump from there. This has some problems, though. The main one is that when you do this in a BASIC program from above the start of the screen memory, you bomb. The reason is straightforward. The BASIC probram is happily working at an instruction at, say, &3600 when the instruction pages in shadow memory. The program promptly pages its top half, including its next instruction, out of existence and stalls!

There are several answers to this. The quick and dirty one is to ensure that your print dump routine (and associated memory switching) is not in the area paged out, i.e. it lies in the area below &3000. As suggested if it is in assembler you can place it at &A00.More professionally, though, you should raise the value of PAGE before loading any program file and store the printer dump between — E00 and the new PAGE (this also becomes necessary with every dump I have because the added instructions mean they are over one page in length, and so cannot fit in at &A00). After all this you will get a patched but working dump.

The other possible choice, which I suspect is slower but otherwise far more elegant, is to use the OSBYTE call 250 (&FE??), which is so new that it is not even in the Welcome guide for the Master. This allows you to read from the screen memory direct, whichever screen mode is in use. I have only just discovered this in the technical guide: if it proves useful then I will report back.

Taking a running jump

by Joe Colquitt

I'm sure almost everybody has come across autoruns when using commercial tape or disk software. Autoruns serve two purposes, firstly to make loading simpler, and secondly to provide some degree of protection for the program's author. I get the impression that some authors have given up on the idea of protection (as have some large software houses) because of the relative ease with which programs can be disassembled.

You'll find that many autorun loaders can be trapped by an ML monitor and examined. It is essential to have a monitor for writing them also, so if you haven't got one, have a look at the end of the article.

A commercial autorun program is usually evident if the tape of disk program is to be loaded ,8,1 or ,1,1 or especially "*",8,1,. This method of secondary loading means that the loader is loaded into the space from where it was saved, and not into BASIC memory. As you may know (or may not but are going to), there is a table of vectors in the area 768-819 ($0300-$0333), which contains addresses that a 64 or VIC jumps to in order to perform tasks such as SAVE, LOAD, LIST etc. These are read by interrupt or indirect jumps in ROM.

I've used the IRQ interrupt in several of the columns. A feature of these vectors is that the computer can be re-directed by changing a vector. Common examples of this are disabl-

ing LIST or STOP.

IGONE is the routine that works out what has been entered, but you are using only the access provided by the vector, not the routine. If the vector pointed to eg $C800, your user routine can take over. The nasties able to be performed in a user program belong in the Sunday Horrors. Some of the twisted things I've seen are distasteful biological messages, disk-wiping or corruption, and lockups. It is just as easy to make the routine friendly, and probably more satisfying in the long run.

The subtlety is this: the LIST (or SAVE, LOAD, etc) vector could be looked at as merely a doorway into the computer. Changing the vector's value is like changing what's behind the door. If you wanted to be protective about a particular program, instead of disabling the LIST proper vector, you could alter the next vector (IGONE) so that anything typed on the screen would, for example, cause memory to be wiped.

An autorun typically makes use of the 'BASIC warm start' vector at 770-771 ($0302-$0303), which is altered to point to the start address of the loader program. The vector at 770-771 is looked at immediately after a LOAD. A BASIC program that is merely LOADed will not RUN unless it is told to, because the vector is pointing to a ROM routine which ultimately justs prints READY, and hands control back to the user (then you enter RUN).

When 770-771 points to an autorun routine, the ML flow keeps going, and control is not passed to the user. To create an autorun, the simplest are written in the block starting at 679 ($02A7), and SAVEd including the 770-771 ($0302-$0303) pair. Routines 1-3 show that block as it would be saved.

Unfortunately, this is one program that cannot be put into data statements (sorry Barry), for the obvious reason that as soon as the warm start vector is changed, the computer is off with the fairies, executing the load.

This doesn't happen if a monitor is used, as the monitor is running in machine language. I can't guarantee that a monitor/assembler running in BASIC will retain control. If you find that your particular assembler can't cope with this kind of programming, write to me for another, or try writing the autorun in a different part of memory and changing the load address on the disk.

Supermon, Micromon, Drivemon, HESmon and Zoom are quite capable monitors. Although there are only 89 bytes from $02A7, that's plenty of room to include instructions for blanking the screen, disabling STOP/LIST, setting colours, etc etc. Resetting the $0302-0303 vector is not strictly necessary if you do not intend to go back into BASIC.

A harder autorun to produce (and capture) is that which loads into the stack. This is really a job and a half, as the stack is a volatile area and subject to corruption by the host assembler. I'm not too sure exactly how they work, and would be glad to correspond with anyone who has further information. I've looked at several, but can't find a common factor. Somehow the stack is loaded with a return address, thus jumping into the autorun. This could be a case of load address alteration. Perhaps I'll come up with an answer one day soon.

If you would like an ML monitor, send me a disk/tape (with sample save) and return postage. Joe Colquitt, 6 Martin Ave, Mt Albert, Auckland.

Boolean logic is straightforward

by Geoff McCaughan

Q & A is a regular series in Bits & Bytes in which we do our best to answer a selection of questions from our mailbag. Why not send yours in today? Post your questions to:
Q & A,
Bits & Bytes,
P.O. Box 9870,
AUCKLAND.

Subject: Boolean Logic

[Q] I am mystified by the line:
100 X(A) = K(A) AND 127 OR 64
This just doesn't seem to make sense!

[A] Congratulations! You have discovered some of the most powerful (though less well known) BASIC operators. In fact, almost every computer language has them, and those that do not labour under a disadvantage. These are AND, OR, and NOT, and are collectively known as the Boolean Operators, their use being known as Boolean Algebra (or Boolean Logic). Don't be put off by the strange sounding names, however, as most people find that Boolean logic is straightforward and easily learnt.

Ordinarily, an IF... THEN statement uses one of the relational operators, = < > and <>. It is a simple step to add Boolean operators. Most will be familiar with the classical application as in, IF X=2 AND Y=3 THEN... and, IF X=2 OR Y=3 THEN... and so on. These examples are exactly what they appear to be, that is the IF statement checks two conditions and acts accordingly. Much less frequently used is NOT, and to understand its operation we have to delve a little deeper.

Boolean algebra relies on testing for truth (not in the philosophical sense of course), so that a condition (e.g. X=2) will be either TRUE or FALSE and a value is assigned to the equation accordingly. Most BASICs use 0 for false and −1 for true, but it pays to check, as some use +1. This is easily done with PRINT 5=5 and PRINT 5<>5 or some similar statement, when the results will be TRUE and FALSE respectively. Depending to some extent on the language you are using, non-zero results are frequently considered to be TRUE. For example it is easy to see that IF A=5... is actually branching on the truth of the condition (A=5). Less understandable at first sight is IF A... but the same rules apply, only the condition is now just a single variable (A). The branch will occur if A is non-zero (i.e. TRUE), so IF A... is simply a shorter way of writing IF A <> 0...

So to NOT. The classical use is for negation of a TRUE and FALSE result; thus NOT 5=5 will be FALSE and so on. However NOT should be used with caution, and results tested carefully because of the way some BASICs handle negation. Usually NOT TRUE and NOT FALSE are safe, but any other non-zero result will give what appear to be weird results.

This brings us to the next area to which Boolean algebra can be applied, Bit Level Manipulation. Boolean operators give us a way of controlling the individual bits of a byte. As you should be aware, all numbers are stored in the computer in binary form, although this fact is successfully cushioned from the casual user of BASIC. In binary 2 becomes

00000010, 16 becomes 00010000, 37 is 00100101 and so on. Each bit represents a power of two (as opposed to the powers of ten we are used to with the decimal system) being 128,64,32,16,8,4,2,1 respectively. All other numbers are made up from combinations of these, to a maximum of 255, the largest number that can be represented by 8 bits. Bit level manipulation applies Boolean logic to the individual bits of a number using a MASK (except in the case of NOT). Some examples are:

```
170 10101010 < OPERAND
AND
 15 00001111 < MASK
=----------
 10 00001010

243 11110011 < OPERAND
AND
127 01111111 < MASK
=----------
115 01110011
```

If the operand AND the mask bits are 1 the result will be 1, otherwise 0. AND is usually used for switching bits off, such as the high-order four bits in the first example. N AND N = N.

```
170 10101010
 OR
 15 00001111
=----------
175 10101111

243 11110011
 OR
127 01111111
=----------
225 11111111
```

If the operand or the mask bits are 1 the result will be 1, otherwise 0. OR is mainly used to switch bits on, such as the low order four bits in the first example. N OR N = N.

There is another version of OR used in ML and other languages, including some BASICs. This is the EXCLUSIVE OR or XOR.

```
170 10101010
XOR
 15 00001111
=----------
165 10100101

243 11110011
XOR
127 01111111
=----------
140 10001100
```

The result will be a 1 if either bit is 1, but not both. N XOR N = 0. With AND and OR, the results of the operation are predictable (in that certain bits will be set on or off) even if the value of the operand is not known. XOR, however, requires that you know the value of the operand to predict the result.

```
NOT
170 10101010
=----------
 85 01010101

NOT
243 11110011
=----------
 12 00001100
```

NOT provides simple negation of each bit, 1 becomes 0, 0 becomes 1, without a mask. The result is called the Binary Complement of the operand. Infrequently used, but powerful when you need it.

This is the course of all those strange BASIC lines such as B = X * P AND Y, POKE 53241, PEEK (53241) AND 16 OR 32, IF J = PEEK(253) * (X=A), and so on. It should be noted that these operators exist in one form only. For instance the Boolean operators in IF X=3 AND Y=2... and S = T AND 15 are doing exactly the same thing, the difference being that the first example is operating on the TRUTH value of the equations X=3 and Y=2, and the second example is operating on the BINARY values of T and 15.

So to your example. If we look at the masks 127 and 64 they will tell us something:

```
Bit # 76543210
      --------
127 = 01111111
 64 = 01000000
```

AND 127 forces bit 7 to 0, OR 64 forces bit 6 to 1, so AND 127 OR 64 combines both operations while leaving bits 0-5 as they were originally.

Boolean algebra provides a useful way of manipulating the individual bits of binary numbers, while leaving other bits untouched. For some applications, such as manipulation of graphics registers or I/O operations, as well as in advanced programming, Boolean logic conquers all!

News views and enlightenment on MS/PC-DOS topics

by Selwyn Arrow

Welcome to this new series about the useful world of DOS. In this series we will be exploring the Disk Operating System as used on the majority of 16-bit machines, namely PC-DOS and MS-DOS based computers such as the IBM PC, its workalikes, lookalikes and clones. From time to time we may stray into covering other types of DOS such as CP/M, both 8-bit and 16-bit (CP/M-80, CP/M-86 CP/M-68 etc), or into some of the DOS peculiar to newer types of computers, usually only by request, and so long as we can locate someone to supply the information or ansers!

Each month we will aim to cover some basic area about MS/PC-DOS and its uses for the relative beginner and include some intermediate or advanced level tips and discussions. As information comes to our attention we will also include short reviews or outlines of books and magazine articles on the subject, as well as programs of interest to experienced DOS users and beginners alike, such as utilities and extensions to DOS that make life, and your PC, just that little bit easier to control.

I cannot hope to do all this by myself so your input is necessary to keep the ball rolling. What we need is feedback at all levels from you the reader, so that we can keep the information flowing.

To begin with, let us define just what a Disk Operating System is, and what it is supposed to do for you and your PC.

DOS is like a background program that is always running, it is usually tucked away in your PC keeping an eye out for any commands you or your application program may send its way. It is the software interface between a computer's hardware such as keyboard, screen, disks and CPU, and you. Its function is to do all the technical actions to make each PC user's life a little easier. It saves you having to keep track of the multitude of comings and goings that occur each time and want to do something useful with your PC.

When you first turn your machine on, DOS (either MS or PC in our case) is read from disk to RAM (Random Access Memory) by a permanently resident program in your PC's ROM (Read Only Memory). When DOS is ready for you to give it a command or to run a program, it will display a prompt on your screen to indicate it is waiting for your action. This prompt, usually in the form of A>, tells us that a program called COMMAND.COM has been loaded. COMMAND.COM is DOS's control program, properly known as a command interpreter for obvious reasons.

Its job is to read and of course interpret each command you type in, find that command, and start it running. This command may be one that is internal to COMMAND.COM, it may be external, or it may be the name of a program you wish to load from disk and run.

Internal commands are built-in to COMMAND.COM so that DOS does not have to look on the disk for them. They are the most commonly used commands such as COPY, DEL and TYPE, but there is a limit to how many of these can be fitted into the space available to COMMAND.COM, so many other commands are kept on the DOS disk along with it.

External commands include FORMAT, RECOVER and SORT. These must be resident on the disk in the current drive for DOS to be able to read and execute them. They are provided on your original DOS disk(s) so unless you have a hard disk system where they are permanently loaded, you will most likely need to insert your DOS working copy disk to make use of them.

If it is not present or you spelt the name wrong you will get the error message "Bad command or file name". This is DOS's way of letting you know it cannot find the command you have requested. If you look in your DOS manual it will tell you what type, either internal or external, each and every command is. It also lists all the error messages and what to do about them.

There is also a special type of external command called a batch file, which is made up of a set of DOS commands. These "mini programs" can easily be written to execute quite sophisticated and often surprising functions. They can all be easily recognised by their .BAT suffix. More about these very useful commands another time. Figure 1 outlines the steps that DOS follows when you tell it to execute a command.

DOS is nearly always kept in RAM ready for use. Even when you tell it to execute an external command or an application program, it is there in memory and the program is loaded clear of it. When this program wants to print a character on your screen or printer it calls a particular part of DOS whose job it is to perform that function. Of course there are some programs such as Decathlon and Kings Quest that include these "low level" functions themselves and so do not require the use of DOS. In effect they include their own form of DOS with

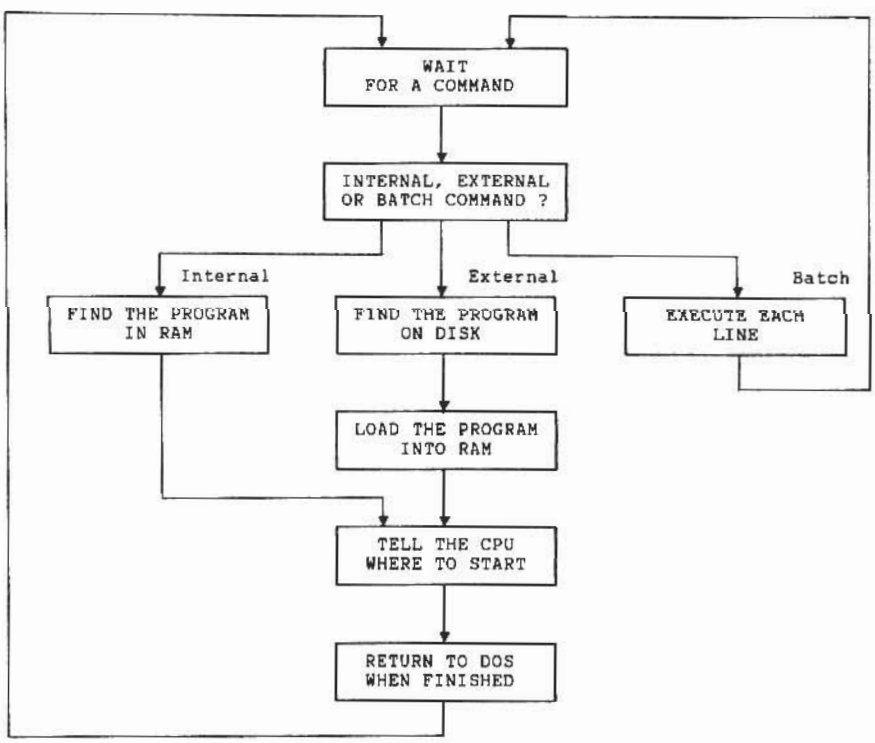


Figure 1: How DOS runs a program.

DOS CORNER

them, as otherwise they could not communicate with your screen or disks.

Next issue we will take a look at the history of PC/MS-DOS. In the meantime, if you use sub-directories on your disks and are familiar with the file called AUTOEXEC.BAT, try including this line: PROMPT pg. We will explain its function and tell you about the special file AUTOEXEC.BAT next time. Hint, you won't get lost using it!

Do start those cards and letters flowing in with your questions, hints or ideas for future topics on the wide world of PC/MS-DOS. No question is too simple for us to answer, and we will try to find answers to the tricky ones as well.

Classy graphing on the Amiga

Reviewed by Colin Marshall

One of the more serious uses that computers are put to is creating high quality graphics and charts for industry. In modern times even small businesses have come to expect their sales staff to graphically represent their work to customers (and the boss).

Many computers claim to do this and can produce a range of somewhat chunky though clear graphics that are then transferred to transparencies for overhead projectors (OHPs) and presented to the viewer as a slide show. Many of these are painfully coloured in to give that professional-looking finish. The Amiga program AEGIS IMPACT is the first program to come on the market that goes one step forward at a reasonable price.

AEGIS IMPACT is a presentation graphics program. Usual such programs aim to have the graphics printed and displayed or seen on a computer by a few people. AEGIS IMPACT aims to produce graphics that can be viewed on either an Amiga or a video machine.

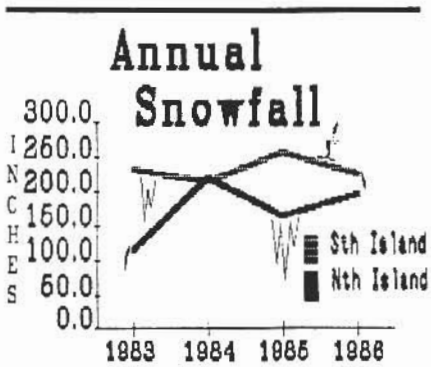
This program is not the world's easiest to come to grips with, even although the manual is relatively comprehensive. The first problem I came across was loading the program from the CLI (Command Line Interface). The manual instructs you to type the name "Impact" and press RETURN. In actual fact this will not work – the name to enter is "Impact!". This, however, is not a major problem as the program can be loaded from the Workbench.

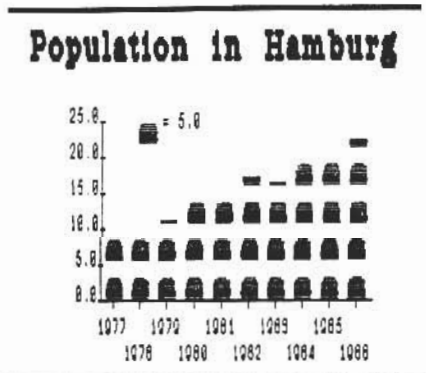
The real fun using the program occurs when trying to change the colours of the graphs if you want to print them out. The program comes with black as the default background colours, which anyone wanting a printout will want to change immediately. Changing individual colours is not hard – until you want to change one colour in a specific area. This is next to impossible, but if you are prepared to spend the time and become used to these intricacies then you can make use of the outstanding areas of the program.

The main thrust of IMPACT as I see it is providing a vehicle to produce graphics to be watched on a computer or video. In essence the program allows the user to create slides of various forms using a number of tools. The completed slides can then be made into a rolling slide show or dumped to a video tape via the composite monitor output jack.

Making a slide

A good graphics program allows a degree of flexibility in the selection and presentation of the graphing method used. AEGIS IMPACT has a reasonable selection. Data can be made into graphs of the following forms – bar charts in 2-D or 3-D, pie charts in 2-D or 3-D, line and area charts, and data (star) point graphs. These are the basic forms only and the tools to modify these charts are extensive. Vertical and horizontal text can be used easily. Sixteen of the 4,096 colours available can be used at one time as well as 16 mosaic patterns, and to be really unusual you can add your own freehand drawings to add to the mixture.





Titles and text are always important on a graph of any form. There are five fonts – System, Regular, Meteor, Shadow, Olde English – and six styles – underline, bold, italics, outline, shadow – to choose from. The text can be placed anywhere on the graph that you like in a range of 18 point sizes. Text can also be made a mixture of colours, for example yellow letters with black borders. This looks good on both the screen and a good colour printer.

One feature that stands alone is the ability to create personalised icons and store these on disk for use in any number of slides. An icon is a small picture. It may be a company logo, a signature, or any other thing you like. Placing people on a population graphs or political party logos on popularity charts is the sort of thing people have become used to on television. These graphs cnow can be created on the Amiga.

Data for graphs can be selected in one of two ways. You can enter the data into up to eight 'stores' at a maximum of 20 items. An item consists of one label and a numeric piece of data. When more than one store is used the computer groups data with a common label together on the chart, for instance all data for a given month. If there is a store with a label that is not matched in any other store, a separate bar is created for that item on the graph.

Data can also be loaded from a file on disk and likewise stored to disk on a variety of paths, both internal and external (which includes hard disk options).

Drop-down menus and the use of the mouse are standard.

The menus are – the standard Project menu with the usual New, Open, Save, Delete, Directory and Print options with an added Fast menu for use when you are familiar with the system. All options refer to slide, graph, table, icon and show features, and these are all parts that can be stored.

A slide is a compilation of an individual graph, a table (a stored block of text), and whatever icons you have created. Show is the order that a number of slides are to be shown, and the pause time selected for each.

The Edit menu features Undo (the last activity), Select (turns on/off edit functions – I can't really see the purpose of this one, which is not needed), Region (for moving areas around), Line Cursor (select crosshair or normal cursor) and Grid (if you want a grid on screen).

The Graph menu has a variety of options that are not as well named as they might have been. Open Series shows the data currently being used, Show Series has the actual "series" that are being currently displayed, and Special allows the creation of special grid referencing and varied scaling. The bar, line/area and pie graph options allow the selection of the type of graph or chart to produce in horizontal, vertical, formatted and exploded forms, while the icon option allows the user to create icons to use with graphs. Import data asks the source from which to import data.

The Shapes menu covers Draw, Arc, Line, Frame, Circle, Text and Grid functions that all work like a good paint program, while the Colour

menu sets the text colours – foreground, outline and shadow – and has an editing mode to select 16 user colours.

Brushes presents a variety of brushes with which to draw, or paint? The Text menu covers the text as mentioned above, and the Show menu allows the user to select two types of slideshow viewing – one automatic using the set pauses, the other manual.

The manual has a relatively good introductory tutorial to get you going, but stops short of teaching you how to use the exciting features. These you have to work out for yourself from the reference sections. There is, however, a good index that makes life a lot easier.

Printing out on a black and white printer doesn't get the results as clearly as one would like. It takes some degree of time and effort to get the printer to produce presentable graphs. First of all you have to go the Preferences option from the Workbench and set the printer type to match the machine that you have. Secondly, set the graphic select to grey scale and the threshold colour to one. This gets the best results.

In conclusion, then, AEGIS IMPACT is a program that is not 100 per cent user friendly. Some things are downright hard to do, but perseverance definitely pays off. The ability to customise screen data to such an extent, and to make use of the Amiga's extraordinary colour graphics to create with a computerised or video slideshow, make the program definitely worth having if you are in any sales or promotion related business.

For the home or casual user, learning the intricacies may be a bit much for the results. The screen results are exciting but the printouts on an average quality printer are not. Creation of icons is no gimmick, but a feature that many people in business would find very useful.

Overtall, then, I rate this a 3/5. In many cases the $250-$300 price tag will be the deciding feature.

THE TYPE UTILITY: Part 4

Disk error channels and I/O status

by Evan Lewis, Ph.D.

The TYPE utility program described earlier opens a disk or tape file and displays its contents. The program has no way of knowing how long the file will be, but it stops and closes the files in an orderly fashion and displays the message "End of file". This is achieved by testing the input/output status register after getting each character from the file:

```
545 get #8, a$
550 if st then gosub 690
```

The I/O status register is referred to by the reserved variable name ST in Commodore BASIC. Each of the bits in the 8-bit status byte is toggled between 0 and 1 to indicate various error conditions. Individual bit locations are tested in BASIC by using the AND operator of Boolean logic and a test byte with the appropriate bit position set.

When the end of the file has been detected, bit position 6 is set. A test byte with only bit 6 set to binary 1 and all other bits 0 has the decimal value 64 ($2^6 = 64$). Thus, the following statement is used to determine whether the end of the file has been reached:

```
745 if st and 64 then
    print "End of file"
```

The AND operator essentially masks off all of the other bits and allows the if statement to make its decision based on the 6th bit alone.

The same technique is used to test various other bits of the status register and detect the serial bus errors they represent. This forms a convenient general purpose subprogram which could be included in most file handling programs (see line 690).

Another method of detecting disk ererors is provided by the disk operating system via a special error channel which has a secondary address of 15.

In the TYPE program the error channel is opened at the same time as the disk file by

```
400 open 15, 8, 15
```

The third number is referred to as the secondary address which communicates to the disk operating system the purpose of the file – in this case a pseudo-file used to return error messages to the computer.

Data is read from this file by a subprogram which includes an input to read file number 15:

```
660 input#15, e1, e2$, e3$, e4$
665 if el = 0 then return
```

Three of the four variables (e1, e3, e4) are numbers and can be read either into string variables ready for printout or into numeric variables, as in the case of e1 in this example.

If the error number (e1) is zero then no error has occured and no action need be taken before returning. If e1 has a non-zero value then the error message read in as e2$ is displayed, along with the track and sector where the error occurred (e3$ and e4$).

This subprogram is called immediately after any disk files are opened (see line 140 of TYPE). If the specified file cannot be found, or a disk is not in the drive or is write protected or the drive is not turned on, an appropriate error message is displayed.

At line 140 of the mainline program, after execution of the file opening subprograms the error number 31 is tested again to determine whether the file was opened correctly. If not, the user is asked to enter the file name and its specifications again.

These two error detection techniques handle most disk errors satisfactorily. Unfortunately, however, they will not trap the "device not present" error which occurs if the printer is not turned on.

From dream to working reality

by John King

The dream that led to the formation of Decision Software by Dr John Bircham and his wife Denise in late 1984 was nurtured over a number of years.

While still a research scientist with the Ministry of Agriculture and Fisheries, John dreamed of the day when it would be possible to present the New Zealand pastoral farmer with a decision-making system that not only included up-to-date research knowledge, but which could also be tailored to the individual needs of the farmer and the farm. "A sort of 'expert system'" is the way John describes it.

In the early 1970s it looked as though the envisaged system would have to be run on a mainframe computer, making it accessible only to the experts. However, with the advent of the microcomputer all that changed. In the beginning the limiting factor was memory capacity, then it was the price, but now neither is a barrier to the implementation of what is thought to be one of the most sophisticated farm production management tools in the world.

John Bircham's system is simple. A series of databases is used to describe the farm, including:

- data on the size, slope, aspect, fertility, etc of each paddock on the farm;
- the liveweight profiles of each stock class on the farm;
- details of calving/lambing, buying and selling, supplementary feeding, nitrogen application, etc;
- details of mob sizes and paddock rotations, etc.

How it works

"These data are used to calculate the likely outcomes of the farmer's management policy," John describes. "The impact of the addition of extra stock, change in buying and selling policy and that sort of thing on feed supply and demand is easily calculated. The effects of different seasons – good, poor or otherwise – are easily incorporated into such planning exercises, and the farm manager is able to assess the degree of risk associated with a particular stock policy.

"Traditionally, farmers have operated with large reserves in their production system to buffer themselves against adversity, but this is no longer possible with every blade of grass now representing potential income."

In John's mind, this is all existing technology in a new guise, making it easier and quicker to use. He has extended the technology further to enable the farm manager to ask such questions as:

"What if I use those mobs and those paddocks?"

"What rotation length should I use and how long should the mob stay in that paddock?"

"Will I pinch the stock too much by slowing the rotation down another 10-15 days so that I can get a bigger wedge of feed in front of me for calving or lambing?"

This facility involves the use of sophisticated simulation techniques based on research information that is largely unavailable to the farmer because it is hidden in scientific journals. According to John, a high degree of accuracy can be achieved because the system can be tuned to current conditions.

And because the majority of farmers have no idea how much pasture they grow on their farms, he has created a pasture growth predictor for New Zealand conditions. This part of his system is based on 25 years of pasture measurement conducted by

MAF all over the country. Rainfall and temperature, pasture species, soil type and pasture management can all be tuned to the local farm without the need for detailed rainfall and temperature records. He says this part of his system has also proved to be "amazingly accurate".

Farmer reaction

What has been the farmers' reaction to John Bircham's system? "To date there are 20 systems out there on farms," he says. "All who have seen it have without exception been impressed. For many, the severity of the times does not allow them to invest. Those who have, however, have found that the system not only generates extremely useful information, but it is also easy to use."

He describes it as being in use on beef and deer units in the King Country and Waikato; dairy farms in Northland, Waikato, southern Hawkes Bay and Wairarapa; and sheep stations in Poverty Bay. Requests for information on the system have come from as far afield as the USA, Sweden, Holland and Australia. Given the current economic climate and the short period of time their product has been on the market, John and Denise consider that the marketplace has said Yes to their system.

"It's interesting to note the difference between farmers and farm consultants in their perceptions of what information is required for on-farm decision making," comments John. "All the farmers opt for the feed budgeting component of the system, whereas the consultants opt for information on pasture growth. No consultants have purchased the system to date, although several have expressed interest."

And what's in the future for Decision Software?

John and Denise Bircham say it has not been easy for them and their family over the past 18 months. Anybody who has developed or been associated with a software package of any worth – outside the major software houses – will know the financial and personal costs they have incurred, they point out. While both realise just how tough the future is going to be, they are determined to be around when farming needs them, and they are optimistic about the future of agriculture and feel there will be a place for their system in future pastoral farming.

Decision Software's system requires an IBM PC or compatible (256K); twin 360K disk drives; IBM colour graphics adapter, enhanced colour graphics adapter, or Hercules monochrome graphics adapter; IBM compatible games controller card or equivalent on a multifunction card; PC/MS-DOS 2.11 or higher.

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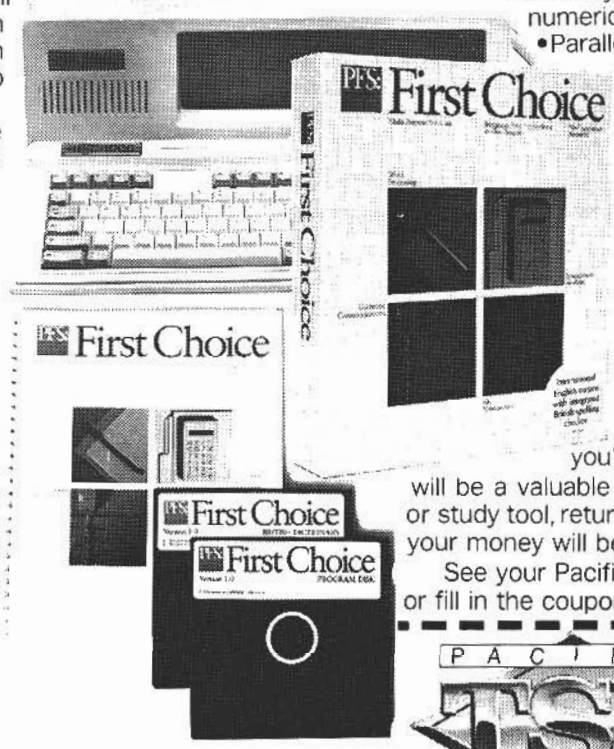

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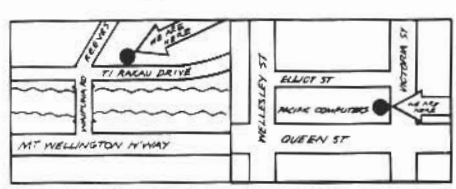

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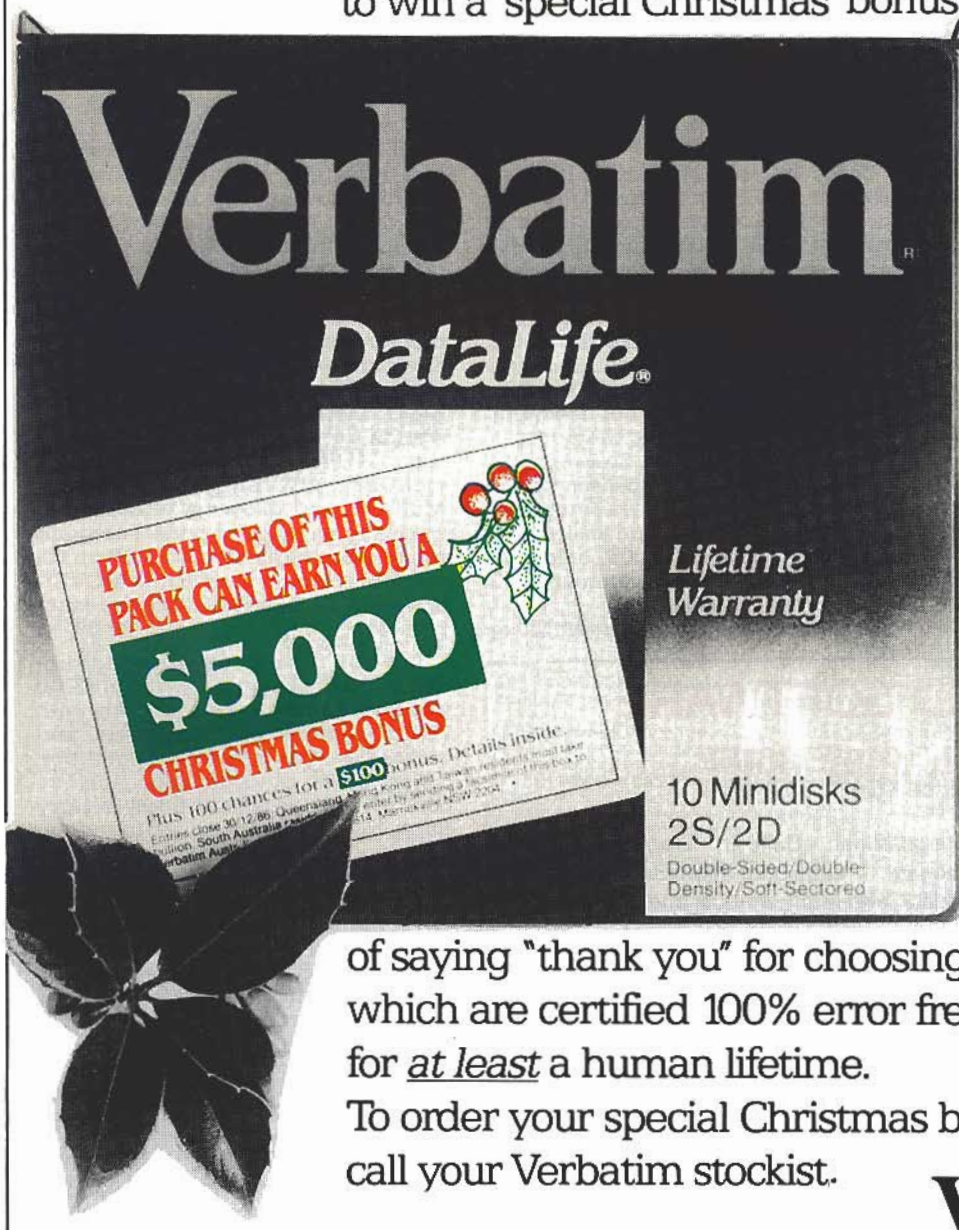

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Moving with the QL

by Gary Parker

Something a little different this month – QL machine code. As you probably know, the Sinclair QL was the first computer to make use of a new microprocessor released in 1983 named the Motorola 68008. This processor and the others in the 68000 family are appearing in more and more computers.

They are 32-bit (compared to the Spectrum's 8-bit Z80a), and are very fast and powerful. The machine code used to program them is also fast, powerful, and easy to use, so I thought we'd take a simple look at how to write 68000 assembly language.

In the Spectrum, each unit of memory, a byte, contains eight bits. There is no larger unit, although two bytes can be combined to form a word. A byte can only store numbers up to 256, while a word can store numbers up to 65536. The QL's processor can manipulate these two units, as well as a long word, which consists of four 8-bit bytes, or 32 bits. A long word can hold numbers up to 4294967296 – over four billion!

In Basic you can have a practically unlimited number of variables named anything you like. In Z80 machine code, you have a limited number of variables, called registers. These are A, B, C, D, E, and F. In 68000 machine code you have sixteen registers – eight address registers, A0 to A7, and eight data registers, D0 to D7. Each register can hold 32 bits. There are also three other less commonly-used registers: alternative A7, Program Counter, and the Status Register.

The most-used instruction in 68000 machine code is MOVE. This instruction can be used to move practically anything into practically anything else.

For example, say we wanted to make register D0 contain the number 4. We would move 4 into D0 with the instruction MOVE.L #4,D0. The MOVE.L means that we want to move a long word, or 32 bits. The #4 means that we want to move the figure 4, rather than a variable of something named 4. The D0 just means that we want to put the 4 into the register D0.

In the same way we can assign any register a value. We can also replace the #4 with the name of another register, such as MOVE.L A3,D1. This would then take the value stored in A3 and put it into D1.

Those of you who know how to program in Z80 machine code will know that a value or register surrounded by brackets refers to indirect addressing. 68000 machine code works the same way. For example, let's examine the instruction MOVE.L (A0),D0. This means 'take the value stored in the memory location specified by A0 and move it into D0'. The value held by A0 is not used, but rather the value held at the address specified by A0 is used. So if A0 held the value 6000, the processor would take whatever number was stored in memory location 6000 and assign it to D0, and if address 6000 held the number 45, after this command D0 would be 45 as well.

So far the things we've seen Move do are very similar to the things that Load can do in Z80 machine code. But Move can also do other things. For example, you can automatically increase the register being referred to after the Move. MOVE.L(A0)+,D0 would put the value stored in the address specified by A0 into D0 and then increase A0 by 4. Why increase it by four? Since we are working with long words, increasing A0 by 4 bytes would make it point to the next long word.

You can also decrease the register before the Move is performed. MOVE.L – (A0), D0 would decrease A0 by one, and then put the value held in address A0 into D0.

There are also other versions of Move which I won't go into here. You can move with displacements (of up to 65536!), move using the total of two registers, and move using the program counter as a reference. This last one is like the relative jumps of Z80 machine code, except that it is rather more powerful and useful. It is considerably easier to make machine code which can be used anywhere in memory on the QL than it is on the Spectrum.

There are a few different types of Move instruction as well. MOVEQ stands for Move Quick, and is faster than MOVE, but can handle only eight bits. MOVEM stands for Move Multiple, and allows a whole list of moves to be made at once. For example to store registers D0 to D7 on the stack you would simply use MOVEM D0-7, –(A7). Register A7 is the stack pointer.

The SUB instruction is used to subtract. For example SUB.L #8,D0 would subtract 8 from D0. As with Z80 machine code, subtractions and additions alter flags called condition codes. 68000 machine code has five condition codes, Z (zero flag), C (carry flag), N (negative flag), V (overflow flag), and X (extend flag).

Branches, equivalent to GOTOs in Basic and Jumps in Z80 machine code, branch according to the condition codes. First of all, the simplest branch is BRA – branch always – which is an unconditional jump. BRA 5000 would branch to address 5000, for example.

The conditional branches are BEQ (branch if Z), BNE (branch if not Z), BCS (branch if C), BCC (branch if not C), BMI (branch if N), BPL (branch if not N), BVS (branch if V), and BVC (branch if not V). These sound complicated but in practice are easy enough to use. For example, if you subtracted 8 from 6, the negative flag (N) would be set to 1. Then if you did a BMI, a branch would occur, since a minus

(Continued on page 70)

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DOS

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With contributions from top-level authorities, the book has been carefully reviewed for technical accuracy by the Microsoft-DOS development team. Topics covered include: The evolution of MS-DOS and the version-to-version differences. The historical view of MS-DOS based on in-depth interviews with the programmers who developed each version. The user's view: working with disks, directories, files, and more. The system view: communicating with the system, device drivers, controlling program flow, and more. The programer's view of system calls: working with disks, directories, files, input and output, memory, and more. Error messages and codes. Glossaries, index.

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Beeblebrox and physics by Craig Beaumont

The availability of quality educational software is critical if the Amstrad range is to be used by schools. When Porterfield Computers offered a chance to review some, I jumped at it. *Better Maths 1* and *Physics 1* are by School Software of Ireland and are aimed at 12-16 year olds. Both are on disc at about $45 each. The aim of these programs is not to teach the subjects, but to reinforce what has been learned in class, and it is recommended that students use the programs with their textbooks. The software is designed for the Irish curriculum, which does appear a little different from ours.

Both programs take the same approach – ten questions are asked on about ten different sections of maths or physics. The questions are of three types – multichoice, numerical or word answers. I'm not sure whether this approach would attract students who are generally averse to tests. Working through the questions is made a little more intersting by the beeping keys and space invader that zaps your score, but it's still basically a test.

Physics 1 gives a brief summary of the theory of each section, then goes on to ask questions, often using clear diagrams. It sometimes gives clues when an incorrect answer is returned – like the first few letters in a word answer. If after two attempts the answer is not given, the program displays the correct answer. Neither program makes any attempt to show how an answer is found if this is possible on screen.

The questions in each section are the same each time, so the programs are not useful for students wanting to practise a section they have problems with. They are likely to be able to remember answers rather than working them out.

Better maths 1 has a number of errors. The statistics section twice asks for the mode (most common number) of a set of numbers when it really wants the median (middle number) or mean (average). It displays two pictograms and asks for the numerical difference between them, which I though was 25, but the program says the answer is 50. In the final section you are asked to divide x(x–5)+1 by (x–5). The answer given as being correct is 1 – another error. Upon hearing about these errors Porterfield sent *Better Maths 1* back – what good is a maths program with calculation errors?

As the programs are in BASIC it may be within the ability of teachers/parents to correct those questions with errors, and they may also want to change those questions not in our curriculum – like the one that asks how much VAT would be added to a £10 purchase.

Would the effort be worth it, though? You would be left with a program still based on the test concept, and there must be more interesting approaches to computer assisted learning. While *Physics 1* succeeds in its aim of backing up that learned in class, the main lesson of *Better Maths 1* is that computers are only as correct as their programs.

Pride Utilities offers a tape to disc transfer service through Goldmark Systems. I decided to take advantage of this service by sending them my tape version of Elite – which has enabled me to make much more rapid progress through the eight galaxies of the Elite universe. They will put original tapes on disc for you at £7.75 for the first program, and £3 each for extra programs that fit on the same disc.

CP/M Plus users will be interested in the growing range of software becoming available for use in this environment. Two examples of the potential of this software are *DR Graph* by Digital Research and *The Hitchhiker's Guide to the Galaxy* by Infocom. *DR Graph* allows Supercalc2 to present its results in a professional manner. The program is menu-driven, allowing very fine control over the output produced.

Installing the program to suit your system has been made as simple as possible. It's just a matter of making backup and working discs, copying the appropriate GSX driver files from your system discs, editing the ASSIGN.SYS file to assign the correct devices and erasing any unnecessary files – simplicity itself! Having two disc drives saves much disc flipping as the program spreads over two sides of disc. See the attached picture for an example of the output quite easily produced with this system.

Hitchhiker's is a must for those addicts of the improbable story of Arthur Dent and his friends Ford Prefect, Zaphod Beeblebrox and Trillian. This is not just an adventure but a piece of interactive fiction created by Steven Meretzky of Infocom and author Douglas Adams that captures the atmosphere of the books, radio and TV series, then throws you right in it. Perhaps the attached sample of the 121K of humour and puzzles best shows the merits of this program

Much is said of the relative reliability of Amstrads. Recently, however, a couple of friends have had some problems. The first was with a fairly heavily used DD-1. A quick internal examination found some broken parts needing replacement, so the drive was sent to Grandstand Computers, the Amstrad distributor, and was repaired promptly with no further problems. On the subject of disc drives I notice other systems have kits to clean their heads – should we be doing the same for our drives?

The second problem was with a malfunctioning printer port. The machine was exchanged by the retailer – for the new style machine with quality connectors like those found on printers. While happy to have proper connectors, my friend has had to change the plug type of his peripherals to fit the new connectors.

This raises the question of whether new peripherals will come out in two versions for the different connectors, or will one group of users have to use cables to link up – and if so which group?

Here begins a transcript of interaction with The Hitchhiker's Guide to the Galaxy.

THE HITCHHIKERS GUIDE TO THE GALAXY.
Infocom interactive fiction – a science fiction story
Copyright © 1984 by Infocom, Inc. All rights rexerved.
Release 56 / Serial number 841221

>LOOK
Bridge
This is the bridge of the Heart of Gold. A gangway leads down, and steam comes from an entrance to port. Next to the control console is Eddie (the shipboard computer).

>CONSULT GUIDE ABOUT HEART OF GOLD
The Guide checks through its Sub-Etha-Net database and eventually comes up with the following entry:
There is absolutely no such spaceship as the Heart of Gold and anything you've ever read in this spot to the contrary was just a prank.
– Galactic Security Agency

>CONSULT GUIDE ABOUT GALACTIC SECURITY AGENCY
Suddenly, agents of the Galactic Security Agency pop in using Sub-Etha belts, rough you up a bit, tell you there's no such thing as the Galactic Security Agency and never to consult The Hitchhiker's Guide about the Galactic Security Agency again; then they leave.

Staff acceptance and training

By Tim McMahon

Having purchased your CAD system you are now faced with what can be the most traumatic phase of any implementation plan: staff training. If, for whatever reason, the system selected is introduced in the wrong way, or the initial training not handled correctly, then the chances are that your investment in CAD will not be as profitable as originally intended.

Senior members of the design and/or draughting staff, having been involved in developing the original benchmark and evaluating the various systems prior to purchase, will ensure that the system selected is accepted as the one best suited to the company's needs, so rejection on that ground is unlikely. However, rejection can still occur if training is not approached in the correct manner.

Firstly, managers must be aware that many people look on computers, even micro computers, as something mystical that can never be understood or operated by them, and consider that if a computer is introduced into their workplace it will probably mean they will become redundant. This attitude can only be dispelled through education and a sympathetic environment. Everybody connected with the CAD installation should be included in its implementation and all should be given an opportunity to train on it. Unless such hidden fears are allayed the true potential of the installation will not be realised.

Any serious CAD vendor will offer, as part of the proposal, a certain amount of training as part of the purchase price of the system, and the majority also provide additional levels of training at a variety of prices. In addition to this vendor supplied training, there are also courses at most of the technical colleges and institutes as well as a multitude of disk-based self teaching modules for the major CAD packages. Each technique has its advantages and what you must decide is which is the best for your circumstances.

The ultimate goal of any training is, at the end of the period, to have the person being trained competent on your system for your environment, and the best way to achieve this is to carry out the training on that system and in that environment. This can be achieved using either the vendor or in-house training, with the ideal being a mixture of both of these.

The level of training purchased from outside the organisation obviously depends on the financial resources available, but it would be false economy to totally ignore this avenue. A good deal of the initial training involves the structure of the package rather than the mechanics of drawing. Such things as drawing identification, drawing parameters, snap and grid specifications, layering and line types, text fonts and hatching are best explained and demonstrated by somebody totally conversant with all of their aspects, to provide the trainee with instant, expert knowledge during his/her first exposure. It is the first exposure that creates the lasting impression, and therefore the best long-term results are achieved by employing the professional. This is strongly recommended if only for a brief overview.

Introductory training is best carried out in a productive environment. The trainee has far more motivation to learn if the end result is something tangible to the job. CAD systems can be wonderful playthings that produce any number of fanciful shapes and patterns. There are almost limitless combinations of commands that will keep even the most unimaginative mind fascinated for weeks as they are explored and tested, but

playing with the system will not achieve the desired objective of learning its potential. Until the trainee is forced to apply the techniques being taught to actually produce a working drawing, there is little likelihood that he will appreciate the approach required.

Introductory training can be obtained either from the vendor or by using the many self teaching modules available. This training should focus around using the basic drawing and editing commands to produce working drawings. There is no point at this time to expect your staff to become instant experts, but on most systems they should become productive within two to three days or the training is inadequate. All staff should be given the opportunity to participate at this level, those who show an aptitude being encouraged to spend more time on the system and develop their skills.

All operators will continue to learn and develop as they become more experienced. Not only are most CAD packages being continually updated and enhanced, but as operators explore the finer points of the system they also find quicker and simpler ways of achieving things. Most CAD systems can be customised with simple user-defined programs. As the operators become aware of this they will wish to explore them. It is through this continual development and enhancement that the real productivity gains are made, and they will not be achieved unless management encourages this approach and provides the funds and the time necessary to achieve them.

In most instances CAD is only a suite of programmes running on a standard computer, and therefore consideration must also be given to ensure that operating procedures are understood and system maintenance carried out. In a very short time after the installation if any CAD system the investment value of the data base will far outweigh the initial capital value of the equipment. It is little consequence to find out about the need for taking backup copies for vital files the day after the hard disk failed and you have lost two months, or even two weeks of data.

To summarise, the decision to introduce CAD is a major step for any company, and therefore care must be taken to ensure it is quickly assimilated into the organisation. Staff acceptance and training is an essential element of that assimilation, and their importance should not be underestimated. Basic and initial training is best provided on site by the vendor of the system, although there are good self teaching modules available that can provide an adequate introduction. The learning process is an ongoing one and staff should be encouraged to develop their skills and keep pace with the changes as the system evolves. Advanced training in the customising aspects of the system will help ensure that the productivity gains available from CAD are realised to their fullest.

If insufficient time is spent on this facet of CAD implementation it is almost certain that CAD will come to stand for Computer Aided Disaster.

Startup files

by Paul Left

This month we look at files which run automatically when booting DOS 3.3 disks, and at ways of changing the name and the type of file available as the startup program.

When we format a new disk with the DOS command INIT, the tracks and sectors are 'marked' on the disk and a copy of DOS itself is transferred to it. Any BASIC program in the Apple's memory is written onto the disk under the name given and then becomes the 'startup' file for that disk. That is, when DOS is booted, it looks for a BASIC program of the correct name, loads it into memory if found, and runs it.

As an example, the command INIT HELLO will cause the DOS on the new disk to look for a BASIC program called HELLO. If no program was in memory at the time, a file will still be created, which will do nothing when run. If the file has been delted since the disk was INITialised, DOS will generate an error message.

This allows us to set up disks which automatically run a program of our choice. While this file is often called HELLO, any name can be used. I prefer to write a menu program onto disk and call it MENU or give it a name which reflects the disk's contents: for example, EDUCATIONAL PROGRAMS or GRAPHICS UTILITIES, etc. Very simple hello programs like the one in Figure 1 clear the screen, print a message, and display the contents of the disk.

A little more complicated, but much more useful, are startup programs which let you type single characters to execute other programs. Figure Two is an example.

```
FIGURE ONE:

10 TEXT:HOME
20 PRINT "EDUCATIONAL PROGRAMS"
30 PRINT CHR$(4);"CATALOG"
```

```
FIGURE TWO

10 TEXT:HOME
20 PRINT "(A) SHAPE EDITOR"
30 PRINT "(B) SHAPE TABLE DEMO"
40 PRINT "(C) SHAPE GAME"
50 GET A$
60 IF A$="A" THEN PRINT
  CHR$(4)"BRUN SHAPE EDITOR"
70 IF A$="B" THEN PRINT
  CHR$(4)"BRUN SHAPE DEMO"
80 IF A$="C" THEN PRINT
  CHR$(4)"BRUN SHAPE GAME"
90 GOTO 50
```

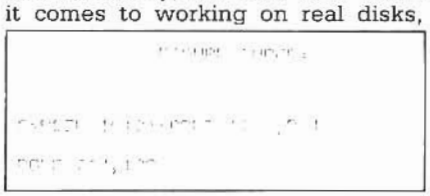
This type of program needs to be modified for each disk and updated if files are added or removed from the disk, hence the popularity of the more complex programs which read the disk catalog into a string array and allow the execution of DOS commands with single key-strokes. If you have a disk with a useful startup program of this type, you can load DOS from a standard disk (your System Master is a good place to start), then LOAD the program into memory. Now place the new disk you want to initialise in the drive and type INIT HELLO. Note that you don't need to use the same name as on the original. Now you can transfer any files you choose to the new disk.

While it is very easy to set up a disk and create hello files using INIT, there are two main limitations. Firstly, only BASIC files can normally be used as the startup file. Secondly, once the disk is initialised, you cannot change the name of the file you wish to be the startup program. Both of these problems, however, can be solved with a little side-stepping. In the first case, you can set up a BASIC hello program to execute a Binary file. For instance, the hello program could be:

10 PRINT CHR$(4)"BRUN EDITOR"

Even the smallest BASIC program uses two sectors of the disk, however, and it is preferable to BRUN the binary program directly. To fix the second problem necessitates either INIT'ing a new disk with the new hello file name and transferring the files over one by one, or RENAME'ing the two files concerned, first the old and then the new hello files. These remedies are obviously not ideal.

By using a sector-editor, however, we can make simple alterations to DOS to fix both these problems and learn a little more about DOS as we go along. To carry out the examples that follow, set up a practice disk with INIT and copy a variety of files (BASIC, binary, and text) to it. When it comes to working on real disks,



however, don't forget to use a copy of the original disk if the files on the disk are important to you, as it is very easy to make disastrous mistakes when dealing with disks on this level!

To alter the type of file which will be executed on booting the disk, start up your sector-editor program and read into memory Track $00, Sector &OD. byte $42 of this sector normally has a value of $06. By changing this to $34 we tell DOS to look for a binary file to BRUN. Entering a value of $14 will cause DOS to look for a text file (File type 'T') to EXEC. When you have changed this byte to the new value, write the sector back to disk.

As long there is a file of the correct type and with the correct name on disk, it will be executed upon booting the disk. If the file is of the incorrect type, you will receive a 'FILE TYPE MISMATCH' error message. If no file of that name is found, you will receive a 'FILE NOT FOUND' message.

Before you leave your sector editor, read in Track $01, Sector $09. This is where the name of the hello file was written when the disk was originally initialised, beginning at byte $75. If your sector editor lets you enter text from the keyboard, just type over the top of the old name. If you are limited to typing in hex bytes, you will need to translate the name of the new hello file into hex first. If the new name is shorter than the old, make sure that it is followed by spaces ($AO in hex). Check your work before you write it back to disk.

After leaving the sector editor, boot the practice disk. You should find that the program with the name you specified is executed. As long as there is a file of the correct type (as specified by the byte on track $00, sector $OD) with a name matching that stored on track $01, sector $09, it will be executed automatically when the disk is booted. If the named file is of the incorrect type or does not exist, you will receive a DOS error message.

There are several advantages in using an EXEC or binary file as the hello file, apart from the two sectors saved by avoiding the use of an intermediate BASIC program.

Binary files can be loaded anywhere into memory, setting up machine-code routines and vectors (see the October 1986 column) or altering the set-up of your Apple more directly than BASIC. Binary files are also much less likely to be modified than BASIC programs, so those who use your disks do so in the way you decide.

EXEC files take over your Apple, effectively disabling the RESET interrupt, and can be used to run BASIC and binary programs in sequence, modify programs, and many other tasks. A good example is usually found on the DOS 3.3 System Master Disk which came with your Apple. The example in Figure 3 POKES values which prevent the BASIC program (which is loaded in the last line) from being LISTed, and cause RESET to reboot the disk.

```
FIGURE FOUR:

NOMONICO

HIMEM: 32768

MAXFILES 1
```

The EXEC file in Figure 4 shows how HIMEM can be set to protect an area of memory, perhaps for a binary program, and sets the number of file buffers to 1. Notice the NOMONICO command which ensures that the commands EXEC'ed are not echoed to the screen. This is best done before the BASIC program starts defining strings and variables, and so an EXEC file which sets these values and then RUNs the program is an ideal solution.

Taking control of the startup file is an essential part of setting up disks which are quick and easy to use. Make sure that the startup program (whether binary, BASIC, or EXEC) sets up the Apple for maximum efficiency, and that it allows easy access to all appropriate files on the disk.

But the program is running!

by Grant Collison

In 1984 I wrote a program which read in membership information from a copy of a database disk, modified some records according to complex criteria, and then when all modifications had been made, wrote the new information back to this disk. The program appeared to be working fine. The test run showed that information was being updated correctly.

I set the program in motion. After about ten minutes the program stopped abruptly to inform me of an ?UNDEF'D STATEMENT ERROR IN 530. The problem was that I was trying to jump to a nonexistent line number.

I felt a bulb glow within my skull as I remembered that the GOTO command does not clear any variables when executed. I typed GOTO 910 (the first line after the non existent line). The computer replied NOT DIRECT COMMAND. What now?

Mystery solved

The prompt character is ']' in Applesoft BASIC, i.e. $33. But when

(Continued on page 70)

(Continued from page 69)

RUN is typed, DOS sets the prompt character to $00 to enable it to distinguish between indirect commands (issued from a program) and direct commands (issued from the keyboard). This allows DOS to prevent the user from manipulating text files from the keyboard, which if done could result in stray text being written over a valuable data file.

The problem is that GOTO is not a DOS command, so DOS ignores the fact that you have typed GOTO, and therefore fails to set the prompt character to $00. Now when the program comes to a statement like OPEN DATAFILE it will result in a NOT DIRECT COMMAND error being given.

The solution is to set the prompt character to $00 before typing GOTO. This will inform DOS that a program is running. This can be achieved by the statements:

POKE 51,0: GOTO <line number>

(Continued from page 62)

occurred.

You can also compare things to set the flags, similar to Z80 machine code, with CPM.

There are quite a lot of other 68000 instructions, but as with Z80 instructions, most of them are not used that often or can be performed another way. For example the EXG instruction – exchange registers – can be performed using MOVE.

The instructions I have given are the important ones, and if you can understand them you will have some understanding of 68000 machine code. You'll be up with the play, and even if you don't have a 68000 computer now, the chances are high that one day you might.

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Faster 1541

Connection, the Christchurch Commodore Users' Group magazine, has passed on some advice from the Melbourne Commodore Computer Club. Those who want extra speed out of their 1541 disk drives can use this two-line program to speed up movement of the read/write head:

```
10 OPEN 15,8,15,"M-W"CHR$(94)
CHR$(0)CHR$(2)CHR$(1)CHR$(41)
20 PRINT#15,"M-W"CHR$(100)
CHR$(0)CHR$(1)CHR$(3):CLOSE 15
```

The amount of time between steps to move the head is reduced by more than half, giving speedier program and file access.

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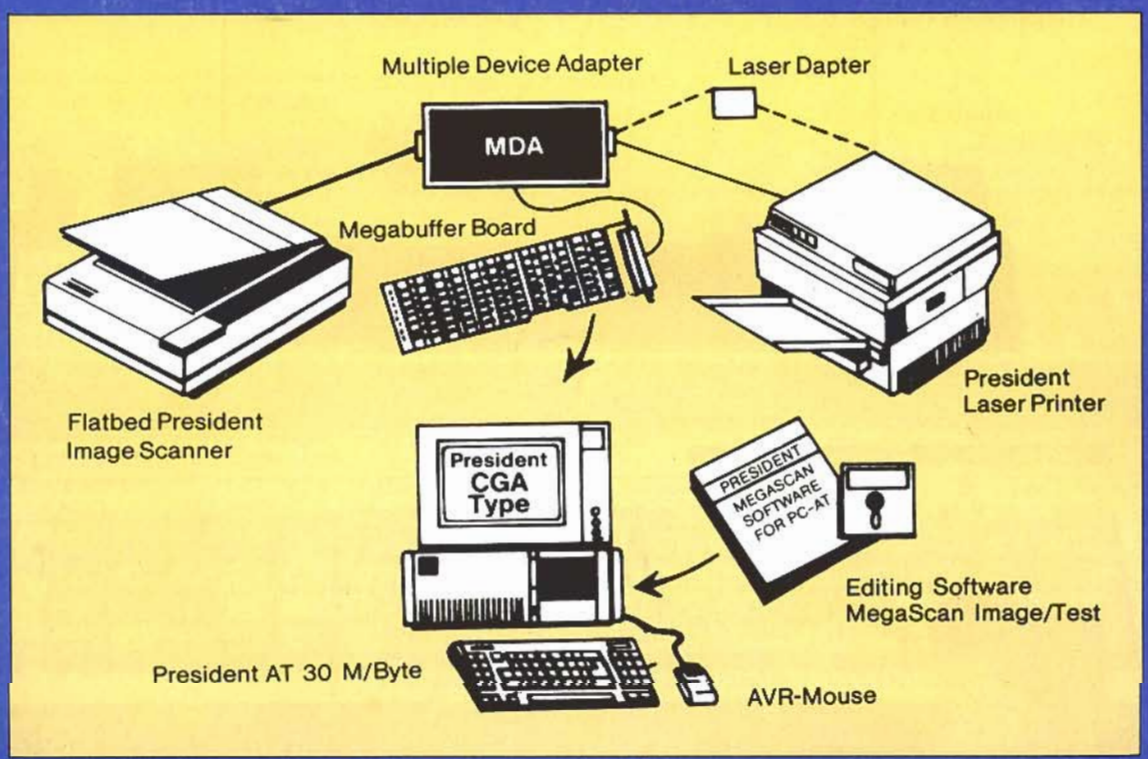

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